

Dar es Salaam City Council
Sokoine Drive, City Hall, Dar es Salaam, Tanzania

Dar es Salaam e-Government Feasibility Study Final Report

January, 2011

**Seoul Metropolitan Government
POSCO ICT Co., Ltd**

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Preface

The “Dar es Salaam e-Government Feasibility Study (F/S)” has been produced by POSCO ICT under the supervision of Seoul Metropolitan Government (SMG). The SMG and POSCO ICT have the ownership on the modification and revision on this report.

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Dar es Salaam
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Final Report

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Part 1. Project Overview

- 1 Project Background***
- 2 Project Objectives***
- 3 Project Scopes and Schedule***
- 4 Project Organization***

Part1. Project Overview

1. Project Background

As a Government-to-Government (G2G) international cooperation, Seoul Metropolitan Government (hereinafter referred to as "SMG") provides a technical assistant, known as F/S (hereinafter referred to as "F/S"). Last two decades, SMG made tremendous efforts to establish e-Government infrastructure and systems. According to a number of research institutions, SMG reached the world's highest level in developing and operating e-Government systems.

Based on these experiences, SMG officially proposed World e-Governments Organization of cities and local governments(hereinafter referred to as "WeGO") at the World e-Governments Mayors Forum (WeGMF) hosted by Seoul in July 2008 when 33 city mayors and representatives from around the globe gathered together and adopted the "Seoul e-Governments Declaration."

WeGO is a worldwide association of e-governments that aims to share the practices of world e-governments, develop joint projects on e-governments, and bridge the digital divide between and among cities.

At the World Cities CIO Forum (WCCF) held in September 2009, Chief Information Officers from 42 cities around the world appointed the mayor of Seoul as an interim president of WeGO and agreed that the secretariat of WeGO is established in Seoul and that Seoul has host the Inaugural General Assembly in September, 2010. WeGO was officially launched at the Inaugural General Assembly.

WeGo seeks to share and disseminate knowledge and practices of e-governments around the world to achieve Green Growth utilizing Information and Communication Technologies; to bridge the digital divide by providing IT support to cities in developing countries; and to advance the quality of life for citizens by improving administrative efficiency and transparency.

Sharing practices of e-government and supporting to cities in developing counties, WeGo and SMG try to support e-government of Dar es Salaam City Council (hereinafter referred to as "DCC") through the F/S

The F/S is an ICT strategy consulting program that enables partner countries to assess the current e-Government (national level and/or local government) status, and to draw realistic e-Government strategies and follow-up projects. With a number of program experiences in various partner countries last several years, the F/S program has been optimizing its assessment methodologies and guidelines.

To assist establishing a local e-Government strategy and plan for DCC, SMG

awarded the F/S project contract to POSCO ICT Co., Ltd, a leading ICT System Integration (SI) companies in Korea. POSCO ICT has various e-Government project experiences including “National Integrated Local e-Government Applications and Network” which is one of the flagship projects in Korean e-Government history. The project concept and its experiences can be shared with partner countries even if the political environment and the system of the law are different from Korea.

Since 2007, POSCO ICT and SMG have been jointly working with several partner countries to promote and to share e-Government project experiences and lessons learned.

During the F/S project, POSCO ICT visited DCC two times: first visit for project initiation and information gathering and the second visit for the reviewing plans and prioritizing and finalizing the strategy and plans. Due to short duration of the program, assessment and strategy developing process schedule were extensive, but with the enthusiastic support from DCC, the consultants were able to complete the F/S project successfully on-time. This is a final version of the e-Government F/S project for DCC, and was prepared based on ample exchange of opinions and information with the DCC.

2. Project Objectives

The main objective of a typical F/S project is to assess the ICT environment and e-Government development status of a partner country, and to deliver a recommended future development strategy and project plans to reduce digital divide, to create more efficient working environment for the government employees, and finally to provide the right services at the right time for the citizens. It is important to state that the know-how and recommendations are based on the SMG’s previous experiences and its current ICT infrastructure and e-Government architecture along with ICT development trend and paradigm.

With such short project duration, it is virtually impossible to provide an in-depth analysis and Informatization plan, but F/S project will overview the current e-Government development in DCC as well as the national ICT plans and policies in order to determine the best possible conclusion.

From the initial desk research results, DCC has very limited resources and systems in terms of e-Government development. Thus, in this F/S project, the F/S project will focus on establishing ICT basic infrastructure, expanding communication channels among the government employees, change management for electronic document management, and finally system and data security management.

3. Project Scopes and Schedule

The project scope has two layers. One is geographical scope which defines the geographical and political boundary, and the contextual scope describes what needs to be done and what to deliver within the project duration. In this project, the geographical scope is DCC in Dar es Salaam, Tanzania, and the 3 municipality.

The contextual scope includes assessment of ICT infrastructure and to draws strategy and follow-up projects. At the end of consulting report, the consultants will introduce and guide the Overseas Development Assistant (ODA) program from the Korean government as one of funding methods.

- Contextual Scope:

- To assess ICT strategy and annual plans, human resources, ICT budget
- To assess ICT key infrastructure (PCs, Network, Application Systems, etc.)
- To define ICT strategy, follow-up projects, and project funding method

The project duration for DCC is two months. The project starts on 22nd of November, 2010 and completes on 21st of January, 2011. Though it has a very extensive project schedule, the project consists of four major phases and seven work processes.

The overall F/S project schedule follows.

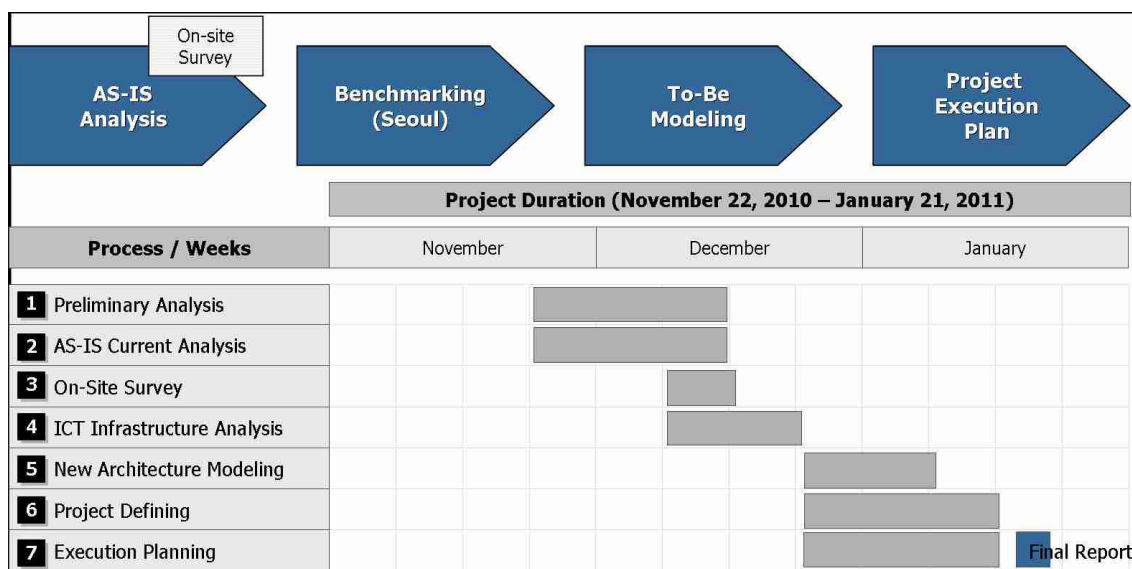


Figure 1: Project Schedule

- Step 1: Preliminary Analysis

It is the first step of the project. The project manager initiates desk research with project team members (consultants) searching for basic information in regard to country fact data, general ICT industry, capability index, and other important

information and statistics including e-Government rankings and competitiveness index from the well-known international level organizations and research institutes such as United Nations and the World Bank.

- Step 2 and 3: AS-IS Current Analysis and Site Survey

To identify e-Government infrastructure status and assess work processes, consultants will visit the partner country. The consultants use various methods to analyze the current ICT status. In most cases, a comprehensive site visit is initiated by the F/S consultants and scheduled in the early stage of F/S project. This visit is intended to gather detailed information from the partner country regarding the ICT infrastructure and resources and operation of Information Technology (IT) systems. The consultants will provide feedback or recommendations for the project during the site visit. It is important to be able to gather enough information for the further analysis, and the coordinators from the partner country arrange interviews and question and answer (Q&A) sessions with the department chiefs. The consultants will prepare questionnaires, templates. It is also important for the coordinators to deliver the requested information on-time.

- Step 4: ICT infrastructure Analysis

The consultants and participating IT engineers start to analyze the partner countries' ICT infrastructure and e-Government applications. While strategy consultants review the ICT infrastructure in terms of ICT policy (national level, local government level), ICT strategy and on-going projects, ICT organization structure, ICT budget and human resources first, IT engineers to review and analyze applications, N/W configuration, customized e-Government software and IT architecture.

- Step 5: New Architecture Modeling

Consultants determine the e-Government potential projects and future model or architecture for e-Government establishment. Usually the to-be image or a new architecture model contains communication channels with the citizen on the left, and core e-Government applications in the middle, and back office infrastructure and applications on the right.

- Step 6: Project Defining

With the sketched future e-Government model (to-be model), the project team members define several projects to be implemented for the next several years (mostly 1 to 3 years). It is important to state that the final to-do-projects will be defined with the partner country.

- Step 7: Execution Planning

A brief estimate will be provided with the project list. In this step, financial resources is also considered so that introduction to Korean government's overseas development assistance.

4. Project Organization

This project is initially organized by SMG, and plays the pivotal role in this project. SMG has the world-class e-Government project experiences, best practices in developing customized government back-office applications and system maintenances. So, SMG oversees and provides guidance in planning and developing strategy.

DCC takes a role in providing the current status of e-Government development and ICT needs. In addition, it coordinates the assessment processes, prioritizing the follow-up projects. POSCO ICT as one of leading system integration companies in Korea provides technical expertise in assessing current e-Government development status, establishing ICT strategy, and phase-wise ICT plans.

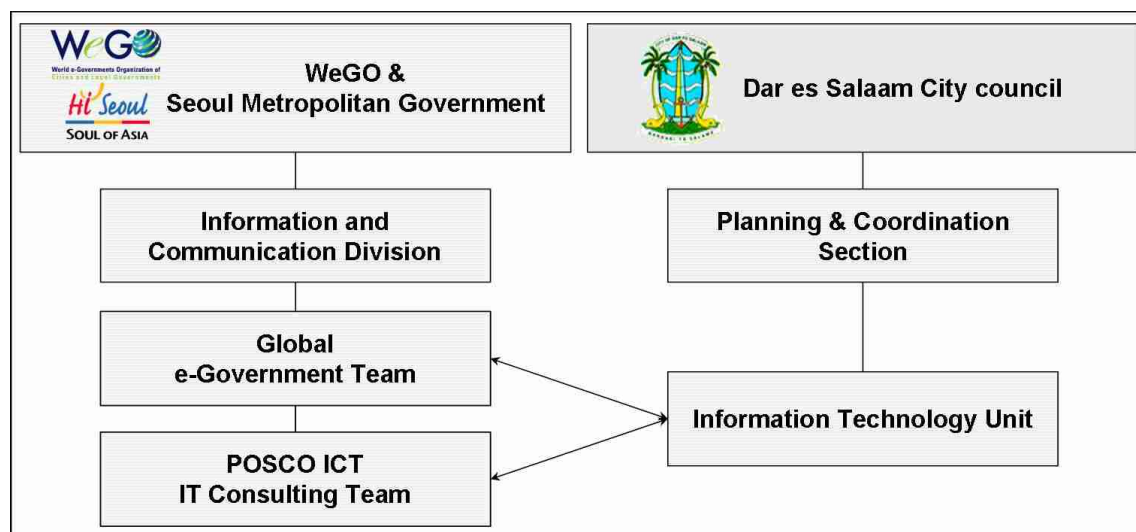


Figure 2: Project Team Organization

The detailed role and responsibilities (R&R) of each organization is as follows:

Category		Role & Responsibility
SMG	Program Management	– Overall management and supervision of the F/S – Provides best practices on its e-Government experiences and expertise
DCC	Planning & Coordination Section	– F/S project coordination . Providing ICT status information . Prioritizing follow-up projects & its scope
POSCO ICT	Project Management	– Overall management and supervision of the F/S – Project Management (Scope, Schedule, etc.) – Review and finalize the project deliverables
	Consulting	– Working-level staffs in charge of assessment and coordination

Table 1: Role and Responsibilities

Part 2. Environment Assessment

- 1 Country Profile***
- 2 Economic and Political
Environment Assessment***
- 3 Technical Environment
Assessment***

Part2. Environment Assessment

1. Country Profile



Figure 3: Tanzania Map (source: CIA Factbook, 2010)

Tanzania, officially known as the United Republic of Tanzania (URT), is one of the five East African countries (Tanzania, Kenya, Uganda, Rwanda and Burundi), has a surface area of 947,300 sq km, and an estimated population of about 41,892,895 as at July 2010 CIA, 2010).

Table 1 below summarizes the main social-economic facts about Tanzania

Category	Fact
Population	41,892,895
Population growth	2.032%
Religions	Christian-30%, Muslim-35%, indigenous beliefs-35% Zanzibar: more than 99% Muslim
Literacy	69.4% of the population (Male: 77.5%, Female: 62.2%)
GDP (Purchasing power Parity)	\$57.61 billion (2009 est.)
GDP - Per Capita (PPP)	\$1,400 (2009 est.)
Labour Force	21.23 million (2009 est.)
GDP (Composition by sector)	Agriculture (26.4%), Industry (22.6%), Services (50.9%)

Table 2: Tanzania-Basic Data as at 2010

Tanzania was formed after the union between Tanganyika and Zanzibar in 1964. While Tanganyika was completely merged in to the resulting Union, Zanzibar retained its semi-autonomous status. Dar es Salaam is the largest commercial city, and Dodoma is the capital city and the seat of the government. In Tanzania English is the official language while Kiswahili is the national language. Tanzania is bordered by Kenya,

representation in Dar es Salaam area. Among those international organizations, WB and UNDP are the two major contributors in Tanzania in terms of ICT and its related development. However, it seems like priority and percentage of ICT projects is still behind from other areas. For instance, a simple analysis of AfDB's previous 26 projects recent 10 years in Tanzania shows that none of them were for IT sector. Even though acknowledging the needs for raising basic life quality and developing social infrastructure, it is necessary to raise priority of ICT projects in order to increase people's self-reliance, government transparency, economic growth, and so on.

Participating international organizations follows: ACP, AfDB, AU, C, EAC, EADB, FAO, G-77, IAEA, IBRD, ICAO, ICC, ICCT, ICRM, IDA, IFAD, IFC, IFRCs, ILO, IMF, IMO, IMSO, Interpol, IOC, IOM, IPU, ISO, ITSO, ITU, ITUC, MIGA, NAM, OPCW, SADC, UN, UNAMID, UNCTAD, UNESCO, UNHCR, UNIDO, UNIFIL, UNMIS, UNOCI, UNWTO, UPU, WCO, WFTU, WHO, WIPO, WMO, WTO

1.3 Administrative Divisions & Population

There are 26 regions, 21 on the mainland and 5 in Zanzibar (3 on Unguja, 2 on Pemba). 99 districts, each with at least 1 council, have been created to further increase local authority; the councils are also known as local government authorities. There are 114 councils operating in 99 districts; 22 are urban and 92 are rural. The 22 urban units are further classified as city councils (Dar es Salaam and Mwanza), municipal councils (Arusha, Dodoma, Iringa, Kilimanjaro, Mbeya, Morogoro, Shinyanga, Tabora, and Tanga) or town councils (the remaining eleven communities).

Tanzania's regions are; Arusha, Dar es Salaam, Dodoma, Iringa, Kagera, Kigoma, Kilimanjaro, Lindi, Manyara, Mara, Mbeya, Morogoro, Mtwara, Mwanza, Pemba North, Pemba South, Pwani, Rukwa, Ruvuma, Shinyanga, Singida, Tabora, Tanga, Zanzibar, Central/South, Zanzibar North, Zanzibar Urban/West

- Population: 41,892,895 (2010 EST, CIA)

The Population density (people per sq. km) in Tanzania was reported at 47.96 in 2008, according to the World Bank. Population distribution is extremely uneven, with density varying from 1 person per square kilometer in arid regions to 51 per square kilometer in the mainland's well-watered highlands, to 134 per square kilometer on Zanzibar. More than 80 percent of the population is rural. Dar es Salaam is the largest city and is the commercial capital; Dodoma, located in the center of Tanzania is the capital and houses the Union's Parliament.

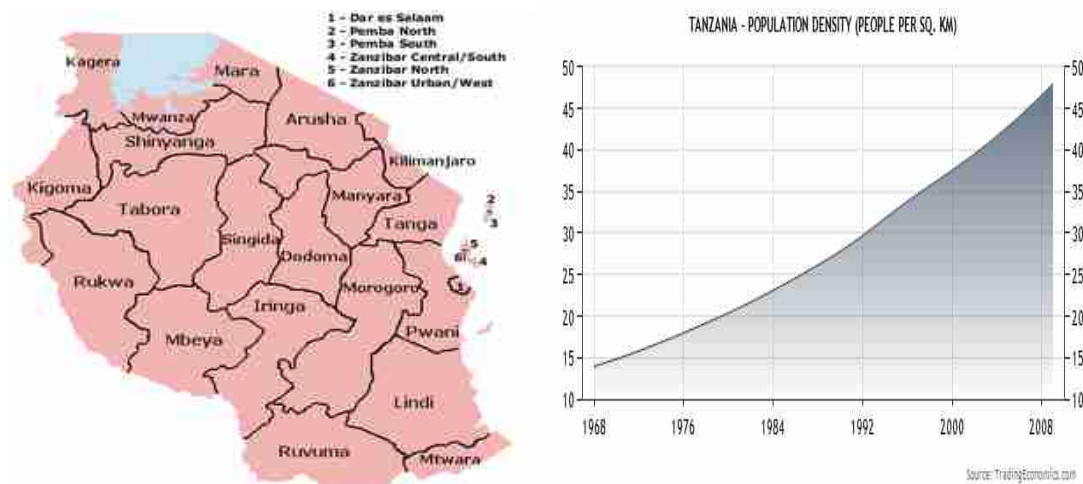


Figure 5: Tanzania administrative divisions & Population distribution

Key Findings

- Dar es Salaam presents itself as the gateway into East and Central Africa. This geographic environment renders Tanzania as a logical investment destination.
- Multilateral Developing Organizations in Dares Salaam contribute many developing projects. But it seems like priority and percentage of ICT projects is still behind from other areas.
- Population in urban area has been increasing due to migration from rural.

2. Economic and Political Environment Assessment

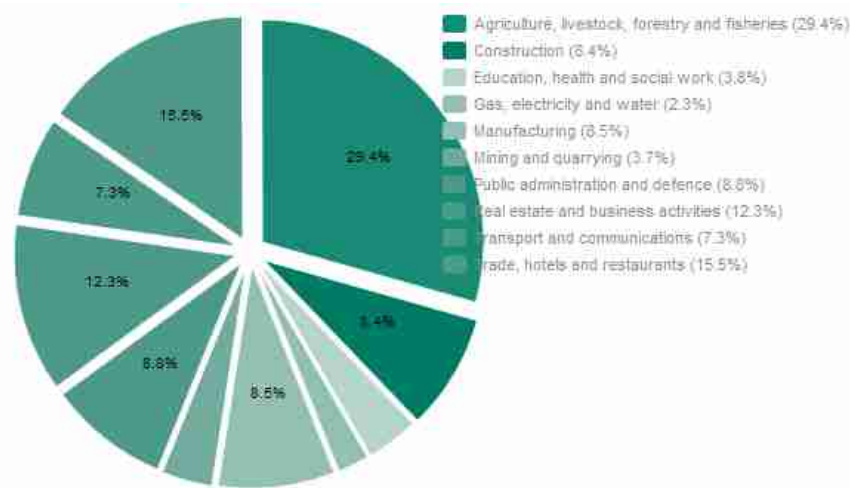
“The Tanzania economy relies most heavily on the agriculture sector for contributions to the GDP; however other sectors are also becoming more economically significant as the country develops. (Tanzania Invest, 2010)”

Tanzania’s economy is one of the lowest in the world, based on the UN statistics for 2009. Almost 36% of the total population (in excess of 43.7 million) lives below the international poverty line. Tanzania has an annual GDP of US\$57.61 billion (2009est), which ranks the nation 85th in the world. However, the GDP per capita is one of the lowest in the world at US \$1,400. Owing to continuing fiscal reforms, the country is able to achieve sustainable economic growth.

Tanzania’s economy is highly dependent on agricultural productivity. The agro sector contributes more than two-thirds of the GDP. It accounts for almost 85% of the total exports and employs nearly 80% of the population. However, agriculture is restricted to

the coastal plains, since nearly 90% of the land is not arable. The small industrial sector basically comprises food processing plants. Light consumer goods are also manufactured in the country. After 2000, the country has also invested in the mining sector. Tanzania has large deposits of gold and natural gas.

Today, the industrial sector in Tanzania is one of the smallest in Africa and accounts for less than 10% of the Tanzania GDP, however the sector continues to be of considerable importance to the Tanzania economy as it is still one of the most reliable sources of government revenue in terms of import sales as well as for both corporate and income taxes, accounting for over half of the annual government revenue collection.



Source: African Economy Outlook, 2010

Figure 6: Structure of the economy

2.1 Government Expenditure and Infrastructure

"Government expenditure in 2010/11 is planned to be 11.6 trillion shillings for both recurrent and development expenditure. (Minister for Finance, Mustafa Mkulo)"

Tanzania's economy, the second-biggest in East Africa, grew faster than most others on the continent last year as gold prices climbed and farming output increased.

It has raise spending by 22 percent in 2010/11 to 11.6 trillion Tanzania shillings, with 28 percent of it from foreign loans and aid. The government put priority on education, infrastructure and health care, which will take up 4.753 trillion shillings of spending, compared with 3.80 trillion shillings in 2009/10.

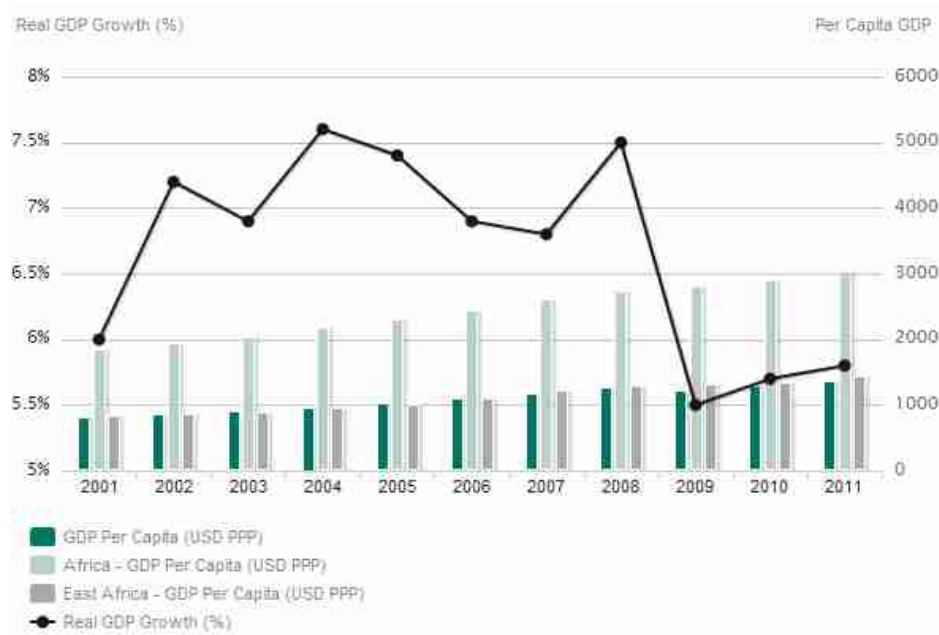


Figure 7: GDP growth and per capita GDP¹

Despite the persistence of structural shortfalls, Tanzania's annual growth averaged 7% of gross domestic product (GDP) between 2001 and 2008. In 2008, GDP rose by 7.5% making Tanzania one of the fastest growing economies in sub-Saharan Africa. The onset of a series of globally-induced crises including fuel price hikes, and the second and third round effects of the global financial crisis have curtailed this record however. Economic growth in 2009 is estimated at 5.5%. Inflationary pressure has also intensified since 2008 pushing the inflation rate to a double-digit annual average of 10.3% in 2008 and 12.2% in 2009.

The 2007 household budget survey reported that agriculture remains the mainstay of more than two thirds of the country's population although it accounted for only slightly over a quarter of GDP and a little shy of 20% of exports in 2007 and 2008. Economic diversification efforts have brought other sectors to the fore, with particularly strong growth in the services sub-sectors of finance, real estate, business services, communication (in particular mobile telephony) and tourism. Industrial sectors including manufacturing, construction and mining have also grown in importance. Lifting growth to match economic potential is nonetheless hampered by an unacceptably high cost of doing business.

Progress in reducing poverty continues to be slow despite high GDP growth. Estimates from the national survey show that over one third of Tanzania's population still lives below the poverty line and income are inequitably distributed. Access to social

¹ IMF and local authorities' data: African Economic Outlook, 2010

services is improving but at a slow pace and it is mostly skewed in favour of urban settings. Meanwhile, the government is developing its second National Strategy for Growth and Reduction of Poverty (NSGRP), which will begin to be implemented in 2010/11.

Tanzania continues to be politically stable. Local elections were conducted in September 2009 and national elections are scheduled for October 2010. The incumbent President Kikwete is expected to vie for another five-year term, and with a weak opposition, the ruling party has high prospects of winning. In the meantime, efforts to fight corruption continue albeit with limited achievements. A breakthrough has been achieved in resolving the long-standing political impasse in Zanzibar Island involving the ruling Chama Cha Mapinduzi (CCM) and the stronghold opposition Civic United Front (CUF). Consultations regarding the most appropriate form of government in Zanzibar and how to achieve it are also ongoing.

	2008	2009	2010	2011
Real GDP growth	7.5	5.5	5.7	5.8
CPI inflation	10.3	12.1	8.5	6.2
Budget balance % GDP	0.0	-2.7	-3.8	-5.8
Current account % GDP	-12.4	-10.2	-13.8	-15.5

Table 3: GDP growth and per capita GDP²

2.2 Political Environment

The country continued to enhance efforts at fighting corruption. Several court charges were filed in 2009 including one involving two former cabinet ministers accused of causing the government to lose billions of Tanzanian shillings while in office. However, slow progress on existing cases is a matter of serious concern and the investigation of several high profile corruption scandals including one involving irregular procurement of power generators dragged throughout 2009. At the same time, the prosecutions of government officials alleged to have been involved in the 2008 Bank of Tanzania's External Payment Account scandal also remain inconclusive. As a consequence Tanzania's position in Transparency International's Corruption Perception Index slipped from 102nd in 2008 to 126th in 2009.

Tanzania is traditionally a very stable country and democracy is improving. The civil tensions indicator in Tanzania reverted to 0 in 2009 from 0.1 in 2008. Troubles linked to

² Ministry of Finance and Economic Affairs; estimates and projections based on authors' calculations : African Economic Outlook, 2010

the movement for Zanzibar independence often occur during election years. By-elections conducted in September 2009 attracted a low turnout of voters, and this was interpreted as a passive expression of discontent with the performance of the government and the ruling party in particular. In the Zanzibar Islands however the pre-election strife intensified and marred the voter registration process, forcing the electoral committee to temporarily suspend voter registration in August 2009 until early 2010.

A major breakthrough appears to have been reached in 2009 with regard to the longstanding political tension between the ruling party (CCM) and the main opposition party (CUF) in Zanzibar. Dissenting voices over Zanzibar's sovereignty and place in the Union continue to be a thorny political issue. Some observers have suggested that a federal government system could provide a sustainable solution. By every count, if the 2009 by-elections are taken as a key parameter, the CCM stands a high chance of winning the upcoming elections mainly due to lack of a clear and unified alternative vision offered by the fragmented opposition parties.

In 2009 the hardening indicator rose from 0 in 2008 to 0.38 in 2009 due to the stronger position taken by the government against ritual murders of albinos. For the first time the death penalty was applied against a murderer found guilty for killing several albinos. The press houses remain partially free as cases of suspended or banned newspapers increased in 2009.

2.3 Financial Indicators

The 2009/10 budget allows for public expenditure to rise to 30.6% of GDP, with recurrent expenditure accounting for 21.5% of GDP while development projects will be allocated a 9.1% GDP share. The total budget stands at TZS 9.5 trillion, and in absolute terms represents an almost 31% increase over the 2008/09 budget. Domestic tax revenues are expected to cover some 56% of spending, while foreign aid (including about 10% allocated to general budget support) will cover 33% of the budget. The 11% budgetary gap is to be filled through domestic borrowing.

The Tanzania government has identified six priority sectors in its Medium Term Expenditure Framework (MTEF) for 2009/10-2011/12, which include education, health, agriculture, and infrastructure including transport, water and energy. In the 2009/10 budget these sectors will receive an estimated TZS 5.1 trillion, equivalent to 64% of the total budget. About 4% of the budget will cater to debt service payments, and another 18% for the public wage bill.

The cash budgeting system being implemented in Tanzania has helped keep growth

of discretionary expenditure in check. However, the country still suffers from poor absorption of development aid caused by delays in disbursing capital expenditure, shortfalls in the capacity of implementing agencies and cumbersome procurement procedures. These constraints in 2008/09, for instance, resulted in development expenditure falling short of the approved budget by some 14%.

In 2008/09 domestic income missed its target by 10%, necessitating borrowing of 1.2% of GDP against a target of zero borrowing. The resultant primary deficit reached 9.4% of GDP. In order to cope with expected shortfalls in tax revenue collection and reduced inflow of foreign assistance, the government has relaxed the zero net domestic financing condition instituted in 2008/09 and expects to borrow about 1.6% of GDP domestically in 2009/10. Furthermore, efforts are being made to improve tax compliance as well as collection of other revenues from natural resource sectors including mining, hunting, forestry and fishing. These sectors have high revenue potential but have contributed very little to government coffers. A major revision of the mining legislation is underway. The government plans to introduce a clause in the revised act that would enable it to purchase a stake in mining companies at the same time as reducing the number of tax incentives granted to the sector.

	2001	2006	2007	2008	2009	2010	2011
Total revenue and grants	22.0	19.0	22.8	21.6	21.5	-	-
Tax revenue	15.0	13.0	14.7	14.8	14.8	-	-
Grants	5.9	4.9	6.9	5.7	5.7	-	-
Total expenditure and net lending (a)	27.8	22.2	22.8	24.2	25.3	-	-
Current expenditure	18.5	16.1	14.9	16.1	16.8	-	-
Excluding interest	17.1	15.0	13.7	15.0	15.6	-	-
Wages and salaries	4.9	5.0	5.0	5.3	5.1	-	-
Goods and services	12.4	10.0	8.7	9.7	10.5	-	-
Interest	1.3	1.1	1.2	1.1	1.2	-	-
Capital expenditure	9.3	6.1	8.0	8.1	8.5	-	-
Primary balance	-4.4	-2.1	1.2	-1.6	-2.6	-	-
Overall balance	-5.8	-3.2	0.0	-2.7	-3.8	-	-

	2001	2006	2007	2008	2009	2010	2011
Trade balance	-6.8	-13.6	-15.7	-16.6	-14.1	-16.4	-17.9
Exports of goods (f.o.b.)	8.2	13.4	13.2	14.7	13.7	13.0	12.2
Imports of goods (f.o.b.)	15.0	27.0	28.9	31.3	27.8	29.3	30.2
Services	2.6	1.9	1.5	1.5	1.6	0.8	0.7
Factor income	-1.5	-0.4	-0.3	-0.2	-0.3	-0.5	-0.4
Current transfers	3.8	4.1	3.9	3.0	2.7	2.5	2.2
Current account balance	-1.9	-8.0	-10.6	-12.4	-10.2	-13.6	-15.5

Table 4: Public finances and National accounts³

³ Ministry of Finance and Economic Affairs; estimates (e) and projections (p) based on authors'

Tanzania's export base has widened from the traditional base of cash crops to include services and minerals. Export performance improved in 2008 growing by 22.7% over 19.1% in 2007. In 2008 about 34.2% of Tanzania's exports were directed to EU countries – the country's longest standing trade partner – followed by Asia at 21.8%. The recently created East African Customs Union also seems to be yielding the expected boost in exports within the region. In the last two years in particular, there has been considerable growth in Tanzania's trade with Kenya, Uganda, Rwanda and Burundi. In 2008, merchandise exports to other EAC countries reached USD 315.5 million, nearly four times their 2004 value.

Exports of manufactured goods performed remarkably, growing by 36.4% in 2008 compared to 16.1% in 2007. This strong growth is linked to a strengthening of Tanzania's trade ties with Asian countries, especially China, India and Japan.

Growth of services however slowed to 6.6%, compared to 22.7% in 2007 due to economic meltdown in European countries, the main source of most tourists to Tanzania. With international demand remaining sluggish, exports are expected to be considerably lower in 2009 than in 2008.

Key Findings
▪ Tanzania's economy is one of the lowest in the world. ▪ The industrial sector in Tanzania is one of the smallest in Africa, however the sector continues to be of considerable importance to the Tanzania economy as it is still one of the most reliable sources of government revenue ▪ Tanzania's annual growth averaged 7% of gross domestic product (GDP) between 2001 and 2008. ▪ Tanzania is traditionally a very stable country and democracy is improving. After election of 2010, political situation also has been stable. ▪ The budget of Tanzania government relies on foreign aid. It covers 33% of the budget

3. Technical Environment Assessment

3.1 Technical Indicators

3.1.1 E-Government Indicators and Status

According to the e-Government Survey 2010 by UN as shown below (See Table 1), Tanzania scored 0.2926 (E-Government Development Index Value) and ranked #137 (World e-Government Development Ranking) among Eastern Africa countries. This means that Tanzania positions in a very low-level among other African countries comparing to several top-ranked countries in Africa, for instance, Tunisia, Egypt, and South Africa which point out roughly average 0.4300 ~ 0.4500 as the E-Government Development Index Value. Likely, current E-Government status in Tanzania can be indicated that it has similar level of Rwanda and Zambia through Figure 1. (See Figure 1)

Country	E-Gov. Development Index Value		World E-Gov. Development Value	
	2008	2010	2008	2010
Kenya	0.3474	0.3474	122	124
Zimbabwe	0.3000	0.3000	137	129
United Republic of Tanzania	0.2929	0.2926	143	137
Madagascar	0.3065	0.2890	135	139
Uganda	0.3133	0.2812	133	142
Zambia	0.2266	0.2812	158	143
Rwanda	0.2941	0.2749	158	143
Malawi	0.2878	0.2357	146	159
Comoros	0.1896	0.2327	170	160
Mozambique	0.2559	0.2288	152	161
Ethiopia	0.1857	0.2033	172	172
...	...	...	...	...
Tunisia	0.3458	0.4826	124	66
Egypt	0.4767	0.4518	79	86
South Africa	0.5115	0.4306	61	97
...	...	...	...	...
Sub-regional Average	0.2879	0.2782		
World Average	0.4514	0.4406		

Table 5: E-government development in Eastern Africa (UN, 2010)

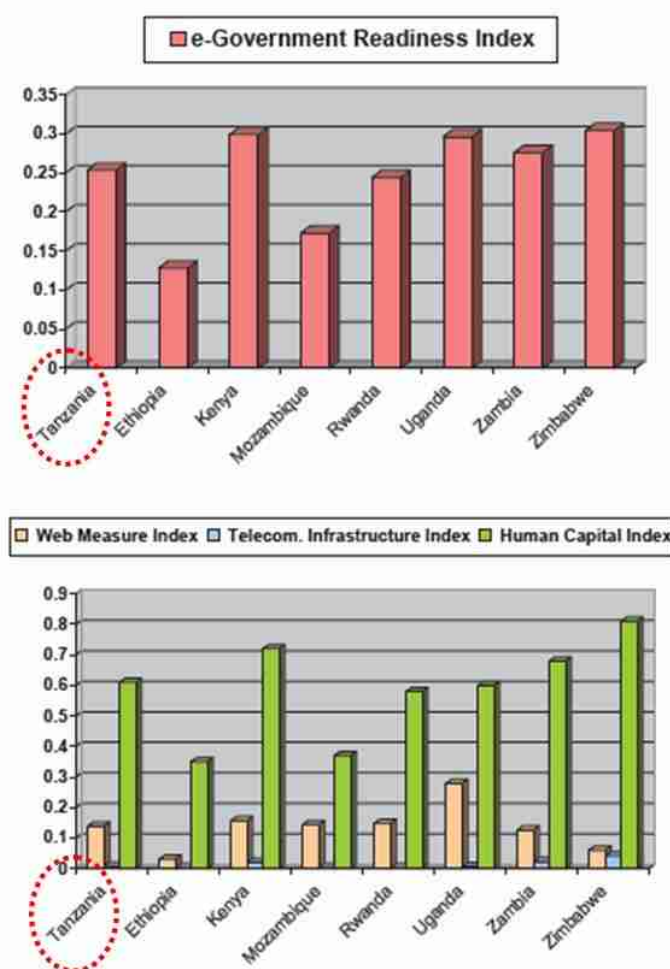


Figure 8: E-Government Readiness Index comparing to other African Countries
(World Public Sector Report by UN, 2003)

On the other hand, comparing to top 20 countries in E-Government Development, it is recognized that current status of Tanzania is extremely low level and positions one of the least developed countries in the world. (See Table 2)

Rank	Country	E-Gov. Development Index	Rank	Country	E-Gov. Development Index
1	Republic of Korea	0.8785	14	New Zealand	0.7311
2	United States	0.8510	15	Germany	0.7309
3	Canada	0.8448	16	Belgium	0.7225
4	United Kingdom	0.8147	17	Japan	0.7152
5	Netherlands	0.8097	18	Switzerland	0.7136
6	Norway	0.8020	19	Finland	0.6967
...	...	...	20	Estonia	0.6965

Table 6: Top 20 countries of E-government Development Index (UN, 2010)

Table 3 indicates the online service stage among UN e-Government Development Stage⁴ I(Emerging) to IV(Connected) (See Table 3) As a result, Tanzanian e-Government ranks #121 among 189 countries which were surveyed and it is recognized to position in emerging and a little enhanced status.

Rank	Country	Emerging Information services (stage 1)		Enhanced Information services (stage 2)		Transactional services (stage 3)		Connected services (stage 4)		Total	
		Points	Score (%)	Points	Score (%)	Points	Score (%)	Points	Score (%)	Points	Score (%)
1	Republic of Korea	66	97	106	91	112	66	31	62	315	78
2	United States	62	91	97	84	115	68	21	42	295	73
3	Canada	59	87	83	72	104	62	32	64	278	69
4	United Kingdom	61	90	87	75	71	42	25	50	244	61
60	Bangladesh	48	71	44	38	5	3	15	30	112	28
65	Angola	52	76	38	33	9	5	8	16	107	27
95	Lesotho	52	76	29	25	1	1	1	2	85	21
106	Afghanistan	41	60	25	22	5	3	2	4	83	21
111	Ethiopia	32	47	23	20	3	2	5	10	73	18
114	Bhutan	30	44	21	18	6	4	2	4	63	16
116	Mali	29	43	12	10	9	5	8	16	59	15
120	Senegal	32	47	14	12	3	2	7	14	58	14
121	Rwanda	24	50	14	12	2	1	5	10	56	14
121	United Republic of Tanzania	34	50	21	18	...	...	...	...	55	14
124	Mozambique	32	47	13	11	3	2	6	12	55	14

Table 7: Online service levels in selected developing countries (UN, 2010)

Key Findings	
- As a macro view, the half-degree of e-Government status comparing other African countries, such as Tunisia, Egypt, and South Africa - Comparing to top 20 developed countries (e.g. Korea, US, and Canada), extreme low-level of e-Government status - Among three e-Gov. Readiness Index value (Web Measurement Index, Telecom/Infrastructure Index, Human Capital Index), the weakness value in Tanzania is the level of Telecom/Infrastructure - Generally, Initial stage just to start emerging e-Government	

3.1.2 ICT Indicators and Status

Apart from external index such as E-Government Development Index and World E-Government Development Ranking, detailed ICT indicators and status in internally

⁴ UN e-Government Development Stage is called as The Maturity Model, and is consisted of 4 Stages : Stage I(Emerging), Stage II(Enhanced), Stage III(Transaction), Stage IV(Connected)

national level can be recognized through some of statistics below.

First of all, according to the data from TCRA⁵, the number of cellular users was 9.5 million, almost 10% of the population by March 2008, while internet users amounted to only 400,000, or about 1% of the population which is from ITU⁶ in 2008. However, the steady growth in the communications sector has been accompanied by small but commendable strides in internet access.

As reported in TCRA, as the population of Tanzania has been dramatically increasing the rate of ICT capacity and operators such as Mobile, Television and Radio have been also growing with together. In case of mobile subscribers, the rate of them is incredibly going up to over 30 (per 100 people) in 2008. It can indicate the interest and needs to use ICT is concentrated on the mobile usage. (See Figure 2)

Despite of remarkable improvements in ICT key statistical indicators, the status of Tanzania Infrastructure Index is still low level. (See Figure 2) For instance, the number of Internet Servers is under 1.0 (per 1 million people) comparing to other Sub-Saharan Africa Region, in addition the rate of Internet and PC usage per 100 users is inferior to less than 1.00. The only thing to occupy over 10.00 is the rate of cellular subscribers per 100 users, exactly 14.78. (See Table 5)

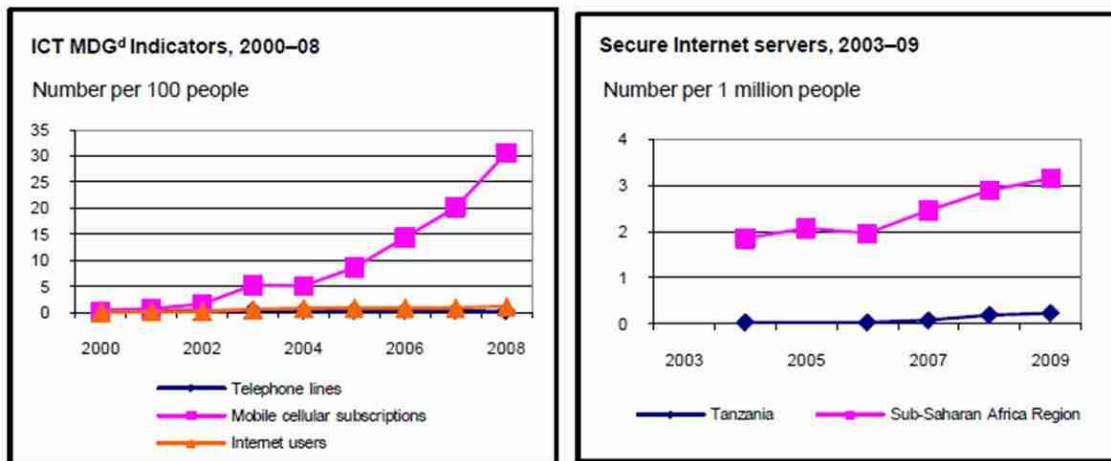


Figure 9: Key ICT Statistical Indicators (World Bank, 2010)

⁵ TCRA (Tanzania Telecommunications Regulatory Authority)

⁶ ITU (International Telecommunication Union)

ICT Indicators (Sector Performance)	Tanzania		Low-income Group	Sub-Saharan Africa Region
	2000	2008	2008	2008
Access				
Telephone Lines (per 100 people)	0.5	0.3	4.6	1.5
Mobile Cellular Subscriptions (/100)	0.3	30.6	28.5	33.3
Fixed Internet Subscribers (/100)	0.0	0.1	1.0	-
Personal Computers (/100)	0.3	0.9	1.7	2.0
Households with a television set (%)	3	6	-	-
Usage				
Mobile Telephone Usage (min/user/month)	-	-	-	-
Internet Users (per 100 people)	0.1	1.2	4.6	6.5

Table 8: ICT Indicators (World Bank, 2010)

Element	Value
Internet per 100 users	1.00
PC per 100 users	0.93
Cellular Subscribers per 100 users	14.78
Main Telephone Lines per 100 users	0.40
Users Broadband per 100 users	-

Table 9: Tanzania Infrastructure Index in 2008 (UN, 2008)

To summarize, Tanzania is still very low-level of infrastructure status and this acts on the connectivity challenges due to the fact of inadequate ICT networks and other supporting infrastructure. Typical examples are the lack of Internet access and broadband range, the limited coverage of mobile, and the usage of ICT equipment, especially computers, is still not widely available.

Key Findings
- As a micro view, the status of Tanzania is still low in general through ICT indicators (Internet and PC usage); however, noticeable point is to dramatically increase in Mobile Access and Usage - With increasing mobile access, it can design e-Government system by using mobile telephone – e.g. ‘mobile service to citizen’

3.2 Major ICT Organization

Tanzania government is largely consisted of the President’s Office, Vice-President’s Office, Prime Minister’s Office and 21 Ministries. And President’s Office has the 3 Ministry of States (Public Service Management, Planning Commission and Good

Governance) under the State House governed by the President.

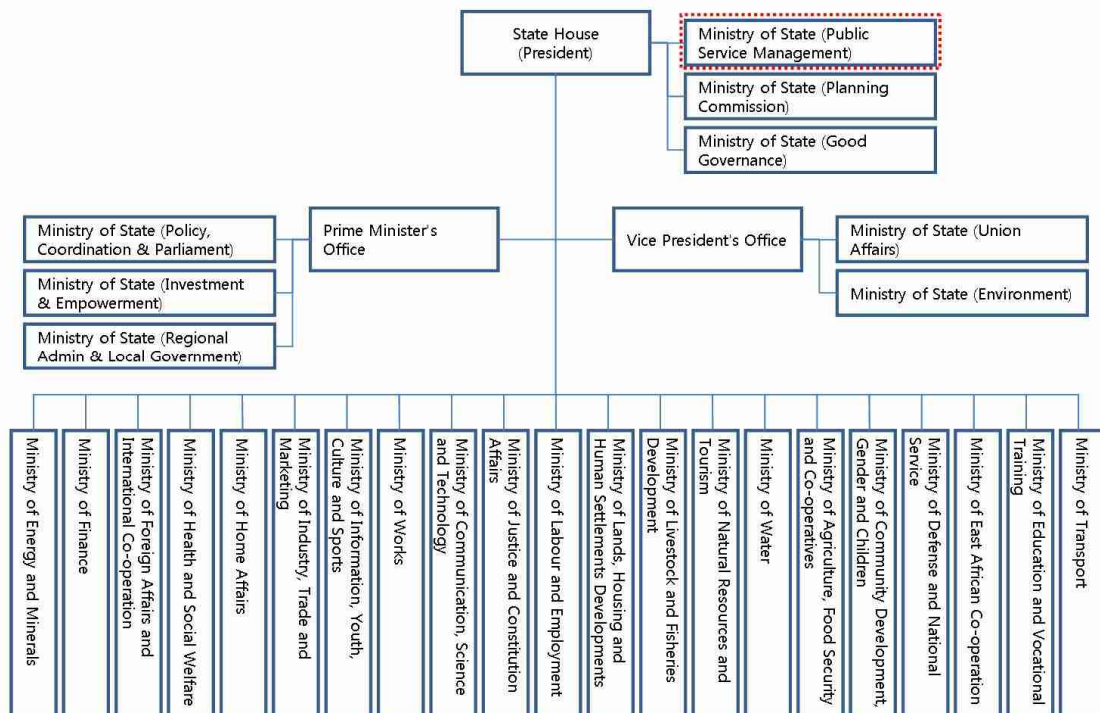


Figure 10: Tanzania Government Organization (source: www.tanzania.go.tz)

Among the above government directory, the Ministry of State (Public Service Management) is one of direct organizations under the President (President's Office) and it was transformed Civil Service Department which is formerly known into the President's Office – Public Service Management (hereafter, PO-PSM) in 2003. Along with the transformation, Tanzania government is taking into consideration the Management of the Public Service with efficiency and effectiveness, especially is on-going implementation of the Public Service Reform.

As a major organization to promote e-Government, PO-PSM is to assist the Head of the Public Service (the Chief Secretary) in matters of personnel and administration pertaining to public service in the entire government system, to provide advisory services to Ministries, Departments and Regions, and to coordinate, monitor and administer all matters related to the allocation of human resources in the Public Service. In addition, developing the skills and knowledge of Public Service Personnel is in charge in the PO-PSM.

As the National ICT Policy in 2003 aligned to National Development Vision 2025, PO-PSM was given a mandate to formulate e-Government policy and its implementations through presidential instrument published through Government Notice No. 20 in 2008.

Key Findings
▪ With the Tanzanian Government's strong will, the President establish direct organization to promote e-Government ▪ As the main organization to promote e-Government in Tanzania, PO-PSM has mandate to formulate e-Government policy and its implementation

3.3 ICT Policy and Informatization Status

3.3.1 National ICT Policy

- ICT Vision

According to the national ICT policy, Tanzania government aligns the vision statement as follows:

“To become a hub of ICT Infrastructure and ICT solution that enhances sustainable socio-economic development and accelerates poverty reduction both nationally and globally.”

- ICT Mission

For the ICT vision, overall mission is established by the Tanzania government is as follows:

“To enhance nationwide economic growth and social progress by encouraging beneficial ICT activities in all sectors through providing a conducive framework for investments in capacity building and in promoting multi-layered cooperation and knowledge sharing locally as well as globally.”

- Policy Context

Along with the vision and mission, the Tanzania government set up the Tanzania Development Vision 2025 with 5 main attributes: High Quality Livelihood; Peace, Stability and Unity; Good Governance; A Well-Educated and Learning Society; A Strong and Competitive Economy Capable of Producing Sustainable Growth and Shared Benefits. On the other hand, this policy has articulated 10 main focus area in Harnessing ICT in Tanzania which include strategic ICT leadership; ICT infrastructure; ICT industry; Human Capital; Legal and Regulatory Framework; Productive Sectors; Service Sectors; Public Service; Local Content; Universal Access. (See Figure 3)

As established in the Tanzania Development Vision 2025, Tanzania government indicates their national vision that “The new opportunities that ICT is opening up can be

harnessed to meet the goals of the Vision.” In addition, this means ICT policy is a reflection of national goals and objectives. For this, central government in Tanzania is also starting to highlight the importance of ICT Infrastructure to enlarge national ICT capacity and the necessity of e-Government in its ICT policy, unlike the past times which was little acknowledgement related to the e-Government.

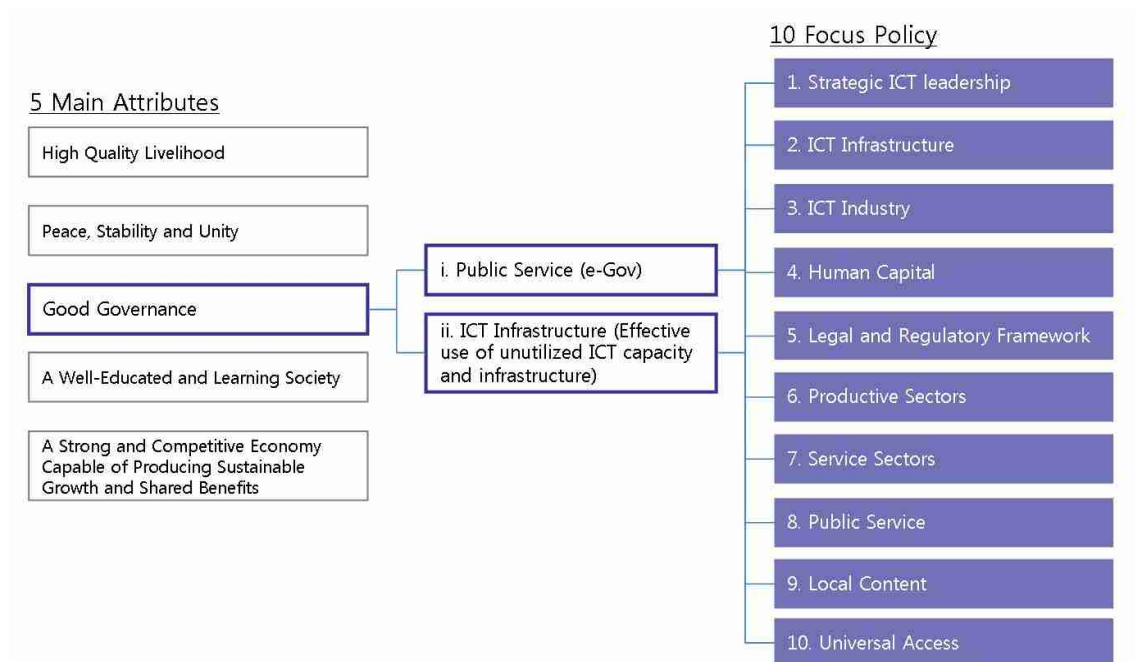


Figure 11: Key Policy Context in Tanzania Development Vision 2025 (National ICT Policy, 2003)

Key Findings
▪ In the Tanzania Development Vision 2025, Tanzania set up the ICT vision and mission to achieve ‘Good Governance’ ▪ For this, Tanzania Government highlights two points with 10 focus policies; i) Public Service reform (e-Gov.), ii) ICT Infrastructure enhancement ▪ 10 policies are major e-Government initiatives which will be promote ICT development

3.3.2 Informatization Status

- ICT Industry

Generally, ICT production in Tanzania is still low, although significant progress has been observed in the telecommunication sector. There are no any locally manufactured ICT equipments and almost all of ICT equipments are to be imported from international manufacturers. However, international fund and foreign investment are going up

- ICT in Education

Tanzania government has been realized the use of ICT in education. Currently, TGDLC⁷ is an example to provide ICT learning programme and most universities (e.g. University of Dar es Salaam and Sokoine University of Agriculture) have implemented e-learning facilitators and dedicated computer centres. However, these facilitators are used in limited urban area (Dar es Salaam), and the bandwidth which is provided in universities is a very low level as the degree of 128 Kbps. Tanzanian Government is often taken as an optional choice despite of high recognition related to the necessity of ICT in reality.

- ICT in Telecommunication

Since telecommunications sector liberalization started, there has been growth in subscriber numbers and ICT market in Tanzania has been also growing. (See table 6 and 7)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Voice Telecom Operators	5	6	6	5	5	5	6	6	6
Application Services (Internet & Other Data)	11	17	20	22	23	23	25	34	60
Radio Stations	14	19	24	26	32	41	47	-	-
Television Stations	10	10	13	13	15	25	29	-	-
Postal/Courier Service Operators	13	16	15	16	32	38	41	-	-

Table 10: Telecommunications Operators (TCRA, 2009)

Year	Benson	Celtel	Tigo	TTCL Fixed	TTCL Mobile	Vodacom	Zantel Mobile	Zantel Fixed	Total
2000	-	-	56,611	173,591	-	50,000	4,007	-	284,109
2001	-	-	89,056	177,802	-	180,000	6,501	-	453,359
2002	-	120,089	160,000	161,590	-	300,000	26,770	-	768,449
2003	-	320,000	210,000	147,006	-	700,000	68,000	-	1,445,006
2004	-	504,000	303,000	148,360	-	1,050,000	85,000	-	2,090,360
2005	-	882,693	422,500	154,420	-	1,562,435	96,109	-	3,118,157
2006	-	1,516,832	760,874	150,897	6390	2,975,580	355,246	747	5,766,566
2007	3,300	2,505,546	1,191,678	157,816	72,729	3,870,843	678,761	5,453	8,486,126
2008	3,000	3,862,371	2,569,527	116,265	105,804	5,408,439	1,057,652	7,544	12,130,602

Table 11: Voice Telecommunication Subscribers (TCRA, 2009)

⁷ TGDLC (Tanzania Global Development Learning Centre)

As the major telecommunication operators, TTCL⁸ (covered in mainland of Tanzania) and Zantel (covered in Zanzibar area) are the two representative fixed-line operators, and Vodacom, Zain, Tigo and Zantel are four major mobile operators.

In a nut shell, despite of extremely growing number of telecommunications operators and subscribers, Tanzania's national ICT Infrastructure is still being developed but has recently accelerated from being insufficient and unreliable to being a fair system operating below capacity. Therefore it can anticipate ICT market will be continuously increasing.

- E-Banking and E-Money

Currently there are two E-money schemes in Tanzania, namely, TemboCard and FedhaCard, which are operated by two different commercial banks. Three banks currently offer mobile banking services.

Mobile payment services are offered by major mobile phone companies whereby their customers are able to send, spend and receive money without having a bank account. Zantel offers Z-Pesa, Vodacom has M-Pesa, and Zain offers Zap.

Mobile banking and payment services are initiated by a customer who fills out an application form and hands it over to registered agents. Upon direct cash deposit or link up with a customer's bank, the customer gets a mobile wallet, which allows them to use their mobile phone in much the same way as a bank account debit card, and manage their money through their handset. Currently, airtime re-charge, water and electricity bills, and major stores accept such payments.

- ICT in Government

The application of ICT in the public sector (e-Government) received its impetus from the Public Sector Reform Programmes (PSRP) and the Local Government Reform Programmes (LGRP). However e-Government initiatives have been fragmented due to the lack of e-Government strategy and coordination. This has caused the President's Office to embark on developing an e-Government strategy and e-Government agency will also be established to coordinate related activities.

The Ministry of Government Administration in Tanzania is currently promoting e-Government policies with high interest in e-Government, However, Government agencies still extremely rely on working process based on hand-writing document, although administrative automation which is highlighted by central government in Tanzania. Therefore, digitization of documents and document management is necessary for efficient administrative process

⁸ TTCL (Tanzania Telecommunications Company Limited)

Key Findings	
▪ In the ICT industry, almost none of locally manufactured ICT equipments; however, it can anticipate the potential ICT market may be positive, due to the increasing international fund and foreign investment ▪ As an example of education centre (TGDLC), Tanzania Government has implemented e-Learning programme; however, it used in limited urban area (Dar es Salaam) ▪ Despite of still low level of national ICT infrastructure, ICT in telecommunication market is continuously going up with extremely growing number of telecommunications operators and subscribers	

3.3.3 E-Government Strategy

Tanzania Government proposed e-Government strategies with connecting to the implementation road map which was articulated by Tanzania Government. The detailed road map and strategy for implementing e-Government is as follows:

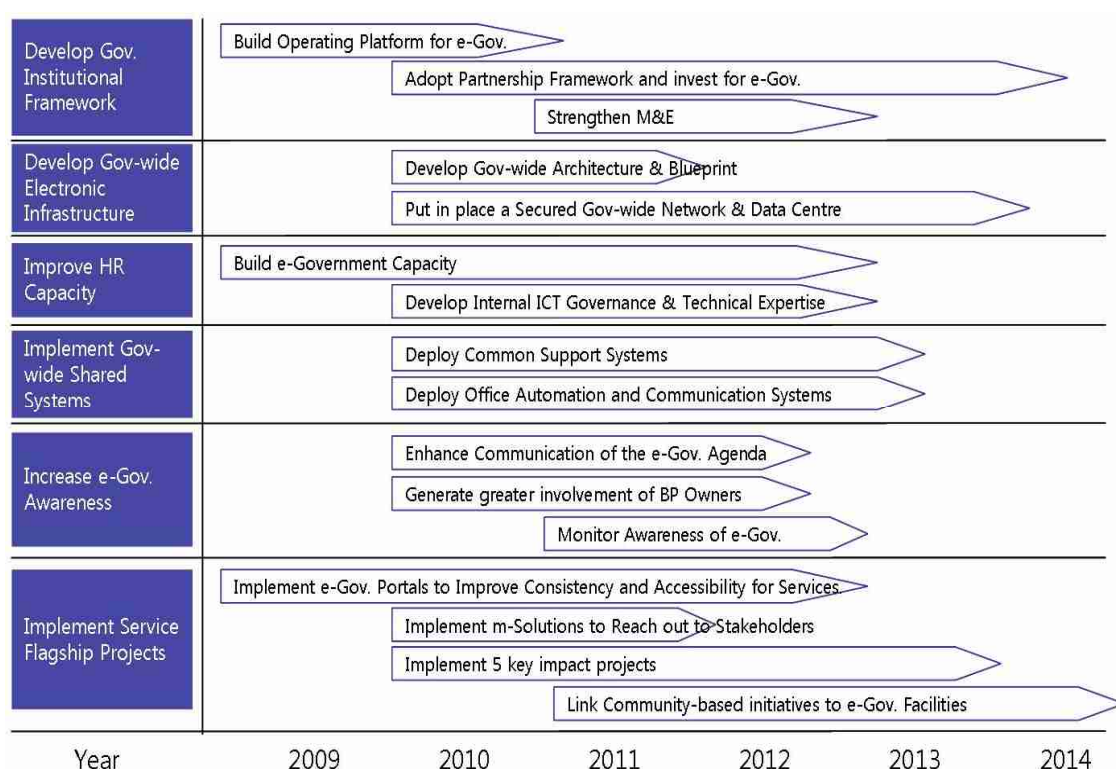


Figure 12: Implementation Road Map (National e-Gov. Strategy, 2008)

5 Objectives for E-Government Strategy
- Institutional Framework developed by 2012 - E-Government Infrastructure developed by 2012 - HR Capacity improved by 2012 - E-Government Awareness increased by 2012 - E-Government Services developed, improved and used by 2012

Table 12: 5 Objectives for E-Government Strategy (National e-Gov. Strategy, 2008)

As seen in the E-Government Strategy above, Tanzania Government is establishing Key Performance Indicators (KPIs) and possible risks each strategy to achieve 5 objectives for e-Government. These KPIs support Government institutions to be accountable for Tanzania e-Government investments and efforts.

Key Findings
▪ With be established in the Implementation Road Map, Tanzania Government set up the e-Government strategy on the base of Tanzania Development Vision 2025 ▪ For this, Tanzania Government set up 5 objectives for e-Government strategy which is related to Institutional Framework, Infrastructure, HR Capacity, e-Government Awareness and Service Improvement

Part 3. Current Status Analysis

- 1 Overview of DCC***
- 2 Business structure***
- 3 Information applications***
- 4 IT infrastructure***
- 5 IT organization & maintenance***

Part3. Current Status Analysis

1. Overview of Dar es Salaam

Dar es Salaam (Arabic: دار السلام [translation: "house of Peace"] Dār as-Salām) is the largest city in Tanzania. It is also the country's richest city and a regionally important economic centre. Dar es Salaam is actually an administrative province within Tanzania. Though Dar es Salaam lost its official status as capital city to “Dodoma” in 1974, it remains the centre of the permanent central government bureaucracy and continues to serve as the capital for the surrounding Dar es Salaam Region.

1.1 Geographical Environment

Dar es Salaam is bounded by the Indian Ocean on the east and by the Coast Region on the other sides. The total surface area of Dar es Salaam City is 1,800 square kilometers, comprising of 1,393 square kilometers of land mass with eight offshore islands, which is about 0.19% of the entire Tanzania Mainland’s area. Administratively, Dar es Salaam is broken into 3 districts: Ilala, Kinondoni, and Temeke. Temeke Municipality has the largest land surface area followed by Kinondoni while Ilala has the smallest area. (Ilala 210 KM², Temeke 652 KM², Kinondoni 531 KM²)

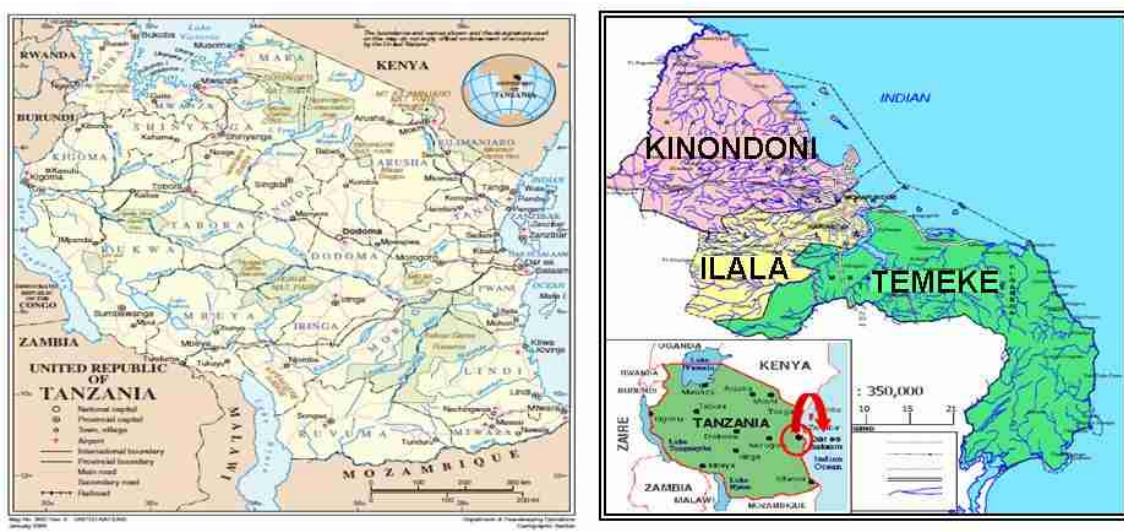


Figure 13: Map of DCC City Council Showing Municipalities

1.2 Economic Environment

Dar es Salaam is Tanzania's most important city for both business and government. The economic output of Dar es Salaam is worth more than 882,000M USD per year

(51% of Tanzania's gross amount). The city contains unusually high concentrations of trade, hotel/restaurant and manufacturing compared to other parts of Tanzania, which has about 80 percent of its population in rural areas. For example, about one half of Tanzania's manufacturing employment is located in the city despite the fact that Dar es Salaam holds only ten percent of Tanzania's population.

Majority of the industrial establishments (64%) are located in Temeke Municipality, 29% are in Kinondoni Municipality and 7% in Ilala. In terms of ownership, 64% are privately owned, 19% public owned and 14% are joint ventures.

1.3 Social Environment

According to 2002 census, there are 2,487,288 residents in Dar es Salaam. The number of population is estimated to be 4,000,000 in late 2010. Nowadays, its population is growing by swelling rapidly from the rural district and other countries. With a population rate increase of 4.39% annually the city has become the 3rd fastest growing in Africa (9th fastest in the world). The population density is 20 times (1,786 persons in 1 Km²) than average of Tanzania (39 persons in 1 Km²).

The sprawling suburbs furthest from the city centre are generally populated by Tanzanians of African descent, with the exception of Oyster Bay, where there is a large population of foreign expatriates. Although there is no racial hostility, the various ethnic communities of Dar es Salaam do not tend to mix heavily. The edges of Dar es Salaam are spreading rapidly, severely taxing the transportation network (which aside from ferries, lacks any kind of mass transit facilities) and raising the prospect of future urban overcrowding.

1.4 Technical Environment

According to government report (from Tanzania communication regulation authority) in 2010, more than 60% of internet users are from organizations and institutions. The users in households or individual count more than 35% of total while there were only 5% of the internet cafes users.

Due to automatic office and growth of income in private, PC could be spread broadly in Dar es Salaam. And Internet cafes locate in every corner of the City of Dar es Salaam. According to ICT4D's report in 2004, there were about 3,000 Internet cafes in Dar es Salaam only. Now, we estimate there are more than 6,000 Internet cafes in Dar es Salaam. Internet café have contributed to some degree of Internet usage. But now, the internet access in internet café is reducing cause of unrealistic charges for offered services.

Considering of population, the number of public & private institutions, and standard of living comparing to other urban and rural area in Tanzania, we could estimate that about 10 % of people in Dar es salaam have experience to access the internet (comparing 1.3 % in Tanzania, World Internet Stats: Usage and Population Statistics (2009))

Key Findings
▪ Dar es Salaam is generally known as the politically and economically core city. In Dar es Salaam, most of ministries and government departments are located in there. In addition, it can be indicated that Dar es Salaam is a core economic city as it occupies the half of economical productivity. ▪ In the Dar es Salaam, many public organizations and private facilitations are positioned, and has higher level of living environments compared to other cities, so that it can indicate the rate of Internet access in Dar es Salaam demonstrates 8 times rather than others from the researched data.

2. The current status of business structure

2.1 The analysis of “Dar es Salaam City Council Strategic Plan for 2010/11 – 2012/2013”

2.1.1 Overview

The Strategic Plan for Dar es Salaam Regional Commissioners Office sets out direction and scope of our mandate including the Vision, Mission, Core Values, Objectives and performance targets for the period commencing from July, 2010.

- The structure of document

- Chapter1 Introduction: this chapter contains “approach”, “environment” and “document layout”.
- Chapter2 Situation Analysis: Through the analysis of the current situation, this chapter finds & discusses about “accomplishment”, “constraints” and “lessons learnt”. This chapter contains “mandate & role of DCC”, “prior vision & mission”, “performance review” and “SWOC analysis”
- Chapter3 The plan: This Chapter presents the plan (objectives and targets) that are

envisaged to be implemented and realized in three years periods (2010–2013). The chapter shows also how the various strategic interventions to be undertaken during the three years of the strategic planning cycle that will lead to achievement of the development objective. This chapter contains “new vision & mission” and “objectives”.

- Chapter4 Results framework: This Chapter shows how the results (objectives and targets) envisaged in this Strategic Plan will be measured as well as the benefits that will accrue to its clients and other stakeholders. This chapter contains “the result framework matrix” and “monitoring plan” etc.

2.1.2 Core constrains and way forward

- **The constrains of “DCC capacity improved”**
 - Existence of employees who lack qualifications for their particular posts.
 - Delays in issuing of recruitment permits
- **The way forward of “DCC capacity improved”**
 - 70 staff attended different courses both short and long- term within and outside the country.
 - Establishment of workers council
 - Employees’ entitlements and allowances paid in time.
- **The constrains of “Quality service Delivery”**
 - Low adherence to procedures for complains from clients.
 - Several occurrences of national calamities/ disasters within the Region
- **The c way forward of “Quality service Delivery”**
 - Public awareness on the structure for disputes and complaints handling
- **The constrains of “Management information system(MIS) improved”**
 - No space for construction of library and resource centre.
 - Erratic electricity supply
- **The way forward of “Management information system(MIS) improved”**
 - Establishing a library and resource centre
 - To install WAN

2.1.3 Core Objective related this study

DCC’s human resource is a crucial asset in order to achieve the organizational objectives. Currently, the DCC is facing short fall in terms of the required number of staff and competence levels. Service delivery has been jeopardized due to this

constraint. However few staffs have been trained on the job and off the job both on short and long courses. Also a big proportion of retooling has been done, workers council established and motivation provided but still further interventions need to be taken. The object for solving above issues is as below:

- Objects G: Management Information System (MIS, e-government) improved.

The plan is to recruit competent staff, train the existing and give motivation; enhance workers participation; institutionalize WAN; introduce complaint handling system; meet overhead and operational costs; develop and implement procurement plan etc .

- Strategy

- Implementation of training program
- E-Government services in DCC improved by June 2013
- Strengthen resource management

- Targets

- Professional training of staff conducted following training programme by June 2013.
- All Sectoral Overheads and operational cost met by June 2013.
- Institutionalize LAN and WAN by June 2013.
- Complaints handling system established by June 2013

Key Findings
▪ As one of factors to interrupt city development which was indicated in the strategic planning earlier, the unstable infrastructure such as lack of educational supporting programmes, the shortage of electronic power or frequent power-cut is pointed out. ▪ DCC is planning to implement e-Government systems for national capacity building until June 2013, For this, the Tanzanian Government is progressing the planning establishment and procurement with the objectives of G2C system implementation including network infrastructure and education for operating the system.

2.2 The analysis of business functions

2.2.1 Administrative overview of Dar es Salaam City

In 1992, a commission of enquiry was set up to investigate why the DCC was not delivering the various city services as expected. The commission revealed some structural and management weaknesses and recommended the dissolution and

restructuring of the Dar es Salaam City Council. In June 1996 the Dar es Salaam City now has four local authorities, that is, three Municipalities of Kinondoni, Ilala and Tekeme and the apex Dare es Salaam City Council.

City Council	Municipality	Division	Ward	Street
Dar es Salaam	Ilala	3	22	102
	Tekeme	3	24	180
	Kinondoni	5	27	127
Total		11	73	409

Table 13: Numbers of divisions, wards and street of Dar es Salaam

2.2.2 DCC city council structure

- The vision & mission

The vision of municipal council is that “An exemplary public institution for advisory and coordination in Tanzania.”

The mission is that “To ensure socio-economic development through provision of advisory and coordination services thus creating an enabling environment for LGAs and other stakeholders to operate.”

- The legal basis for the municipal council's function

Through the “Government (Urban Authorities) Act Act NO.8 of 1982 and Local Government Laws (Miscellaneous Amendments) Act NO.6 of 1999”, the functions of municipal council were already announced. The defined functions are as below.

- To coordinate the powers and functions of the three municipal authorities regarding infrastructure.
- To prepare a coherent city wide framework for the purpose of enhancing sustainable development
- To promote cooperation between the city council and the three municipal or local authorities
- To deal with all matters in which there is interdependency among the city's local authorities
- To support and facilitate the overall functioning and performance of the local authorities
- To maintain peace, provide security and emergency, fire and rescue, services ambulance and police
- To promote major functions relating protocol and ceremonies

- The current status of DCC's organization

The Dar es Salaam city council has approximately 485 employees for the HQ. And totally, including the regional hospitals, DCC has approximately 1,000 employees

The organization chart of city council level is as below,

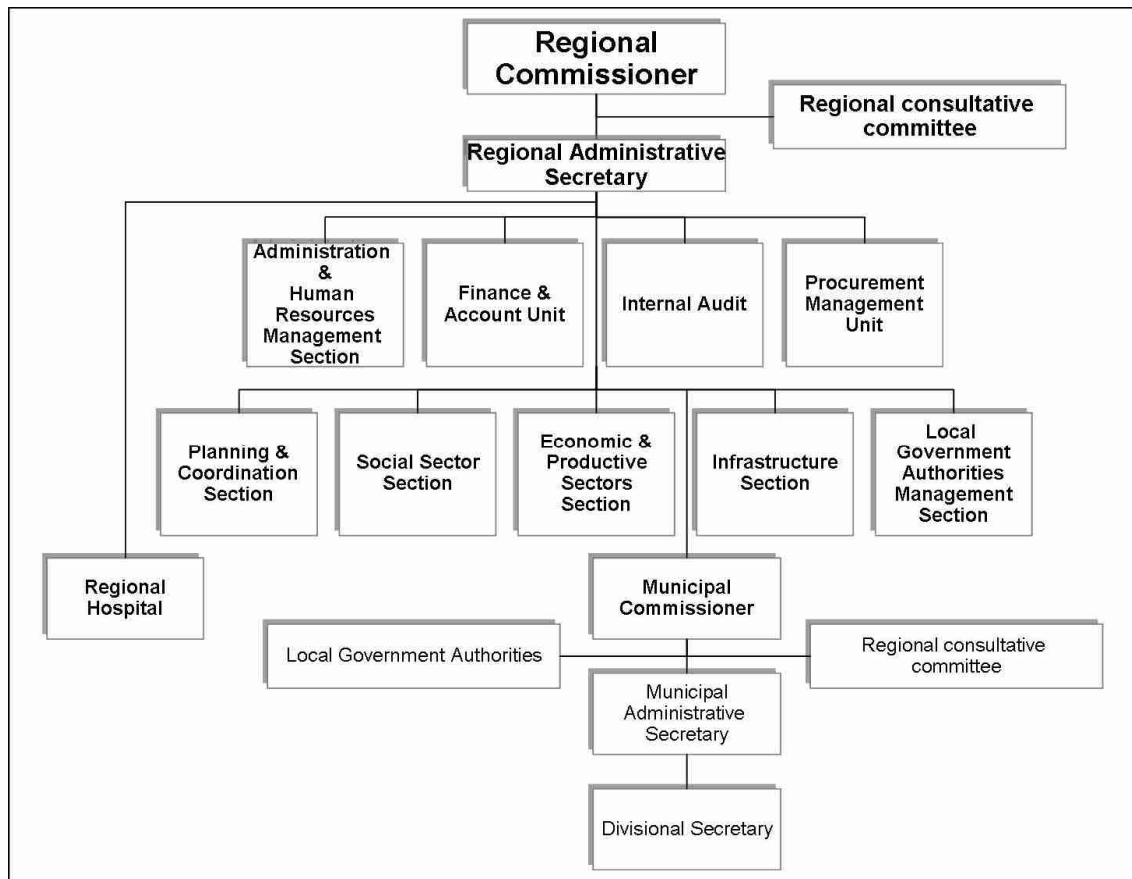


Figure 14: Organization chart of City Council

2.2.3 Municipal council structure (Ilala, Kinondoni, Temeke)

- The vision & mission

The vision of municipal council is that “the municipal council envisages within the coming ten years having a community with sustainable social and economic development.”

The mission is that “through participatory resource mobilization and utilization, the municipal council is committed to enhance the quality of social and economic services by use of existing resources and opportunities.”

- The legal basis for the municipal council's function

Through the “Government (Urban Authorities) Act of Act NO.8 of 1982”, the functions of municipal council were already announced. The defined functions are as below.

- To main peace and security if residents as well as that of public and private

property

- To provide social and economic services to residents
- To raise and accelerate business and industrial production
- To create conditions conducive to poverty reduction and assists the youth, elderly, disabled and other disadvantaged groups to productive in economy

And the municipal council has to provide the services as below.

- Health, solid waste management
- Infrastructure including road and water
- Trade and industrial promotion, cooperative and informal sector promotion
- Community development
- Urban development, natural resources, agriculture and livestock
- Education and culture

- The current status of Municipality's organization

The each municipal council has approximately 4,000 employees allocated in each department at HQ, Wards, sub-Wards, health and education facilities. (Based on Kinondoni status)

The most populated department is education with 3,000 employees followed by Health with 700 employees.

The organization chart of municipal level is as below,

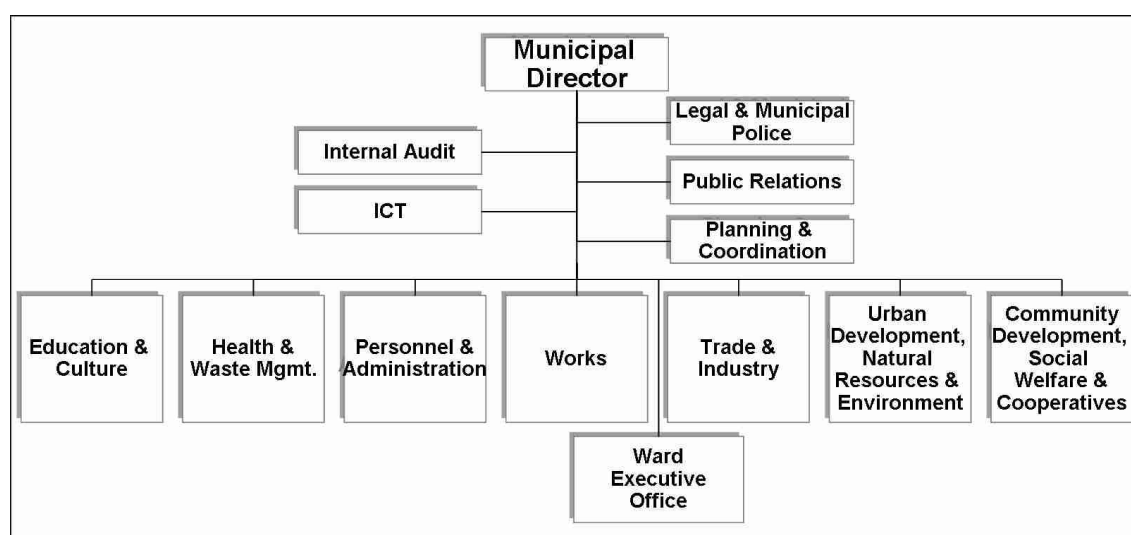


Figure 15: Organization chart of municipal council

2.2.4 Service function classification

DCC and three Municipalities' functions could be classified as service. The classified functions are as below.

Functions	Central Government	DCC	Municipality
General Administration			
Police	V	V	V
Fire protection			V
Civil Protection	V		
Criminal justice	V		
Civil justice	V		
Civil status register		V	V
Statistical Office	V		
Electoral register	V		
Tax collection			V
Education			
Preschool			
Primary school			V
Secondary school			V
Vocational and technical	V		
Higher education	V		
Adult education	V	V	
Social welfare			
Kindergarten and nursery		V	V
Family welfare services		V	V
Welfare homes		V	V
Social security		V	V
Public health			
Primary care			V
Hospitals	V	V	
Health Protection	V	V	V
Housing and Town Planning			
Housing			V
Town planning		V	V
Regional planning	V		
Transport			
Roads	V	V	V
Transport	V	V	V
Urban roads		V	
Urban rail			
Ports	V	V	V
Airports	V	V	
Environment and public sanitation			
Water and sanitation			V
Refuse collection and disposal			V
Cemeteries and crematoria			V
Slaughterhouses			V
Environmental protection		V	V
Consumer protection		V	V
Culture, leisure and sports			

Functions	Central Government	DCC	Municipality
Theatre and concerts		V	V
Museums and libraries		V	V
Parks and open spaces		V	V
Sports and leisure		V	V
Religious facilities		V	V
Utilities			
Gas services			V
District heating			V
Water supply			V
Electricity	V	V	V
Economic			
Agriculture, forests, fisheries	V	V	V
Economic promotion	V	V	V
Trade and industry	V	V	V
Tourism	V	V	V

Table 14: Classified service function

The DCC is mostly responsible for the cooperation between central Gov. and municipalities and planning/monitoring the urban policies. And DCC directly manages some urban roads and health/education facilities.

The municipal councils are responsible for the provision of basic social services that includes primary education and partly secondary education especially where the community is involved, primary healthcare, waste management and cleanliness, district roads, water supply and monitoring trade activities and development activities especially informal sector development and management, cooperatives, agriculture and livestock development, forestry, fisheries, recreational park and urban planning. Through the Property tax collecting, Municipalities apply the tax to the municipal budget.

Key Findings
▪ In fact, there are a little bit different roles between DCC and Municipal council. Firstly, Municipal council is charge of providing actual public service for the people (e.g. education and hospital etc) on the other hand, DCC is performing to coordinate for planning and managing between them. ▪ For this, it can be indicated that the role of Municipal council is crucial for the system implementation for G2C service. ▪ Municipal council directly collects property tax and they manage as budget by themselves so that it needs transparency and accuracy of tax revenue for the stable management

2.3 The analysis of requirements and issues

2.3.1 Administration & personnel section

- Current status



Figure 16: Document achieving room

- Managing the official letters, personal profiles & personnel records, operating documents including important contexts & contents and list
 - The specific number are given in all documents, and it is recorded in lists
 - Registered original documents are archived as having numerical orders, and they are stored in cabinets
 - Original documents and Document lists are not managed as the file type
 - Human Resources Management (HRM) system is used in the Central Government; however it has not been used in Local Governments.
 - All documents are stored for 10 years, and are discarded afterward.
 - Information related to personnel changes is noticed through telephones
- Requirement & issues**
- Due to the low quality of paper, some constraints of external environment (e.g. humidity, temperature etc), the status of documents storage is vulnerable
 - Paper documents are easy to be destroyed and be damaged; in addition it takes longer times to find records archives when information is required.
 - With this, numerous cases (esp. personnel records) may takes much longer times to find related information, because of not to update in real-time.
 - Through this current status, informatization such as Payroll sheet, Personnel

records and Official documents management is practically needed; but it has not been acted due to lack of methods and budget.

- Further, communication between civil servants is another issue so that effective contact means are needed between them.

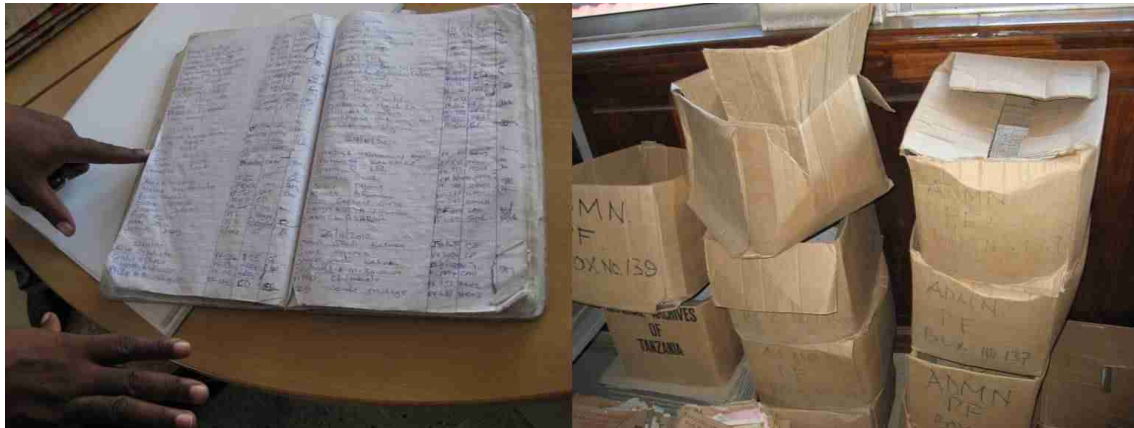


Figure 17: The current status of document management

2.3.2 Finance & account unit

- Current status

- Currently, budget execution is managed by Finance & Account unit, EPICOR system is implemented and operated with the budget from the Ministry of Finance in 2000
- The Ministry of Finance is also charged in system maintenance and education for system operation

- Requirement & issues

- EPICOR is used by several civil servants; however there are nearly professional system administrators, in fact only under 3 public servants understand the system
- Regular system training education is required to prepare cases that system administrators / operators change; however actual training is hard to progressing cause of high cost for education (2,000\$ for 2 weeks)
- Most of civil servants do not have sufficient technical capability, and educational programmes which are acted in the Ministry of Finance are also nearly understood among them.

2.3.3 Planning & Coordination Section

- Current status

- IT Unit is under the Planning & Coordination Section.

- All official documents are written by hand-writing and managed through list of documents, and handed them in person (through offline)
- No regulation to manage digital files
- Nearly use e-mail within internal divisions; whereas little be used (approximately, 20~25%) in cooperation between other government organizations

- Requirement & issues

- Issues about low usage of e-mail may gradually happen as increasing cooperation between other government organizations.
- Unsystematic documents archive is another issue due to the lots of hand-written documents, moreover it may takes much considerable times and have task burden.

Key Findings
▪ In a nut shell, it takes considerable time and costs to deal with tasks, because systematic task process and working environments are not formalized ▪ Especially, document management is the vulnerable, furthermore administration of personnel parts is suffered from managing personnel records, due to the absence of adequate document management system ▪ In addition, communication between governmental divisions and external organizations is gradually emphasized; however, they also suffer from performing their business, because of lack of business infrastructure ▪ Innovation of working process by using information system is crucially needed ▪ Meanwhile, the necessity of information system is realized internally, the current situation has not been improved, due to the shortage of physical resources and human resources to plan and implement them

3. The current status of information application

Three same information systems (i.e. EPICOR, GIS, MRECOM) are used in four city councils in Dar es salaam, those are developed by the Central Government. Major system contexts are as follows:

3.1 EPICOR

- General status

EPICOR system is one of application systems for finance management, is used in Dar es Salaam City Council (DCC), Kinondoni, Ilala and Temeke. Under the Ministry of Finance, it was developed in 2000 and has been operating in 4 councils. The cost to introduce the system in the each council takes approximately US\$ 20,000 ~ 36,000

Major functions of EPICOR are to manage tax revenue, receipt issue and expenditure records. Public servants who are charge of tax revenue management issue receipts and then type its records in spread sheet (Excel file), after that the records are saved in EPICOR system. In Dar es Salaam City Council, 13 public servants are using the EPICOR system, 25 officers are using it in Temeke

Council	Induced Year	Managing Dept.	Utilizing Dept.	User Number	Budget(US\$)
DCC	2000	Finance	Finance	13	20,000
Temeke				About 25	36,000

*reference: the status in Kinodoni, Ilala is regarded as that of Temeke

Table 15: Common status of EPICOR

- Configuration of Application system

EPICOR has a central server in DCC, and three systems which are operating by local government are connecting with WAN(Microwave-linked), input data is transferred to the central server. The system is consisted of C-S configuration (Client / Server), it links to PLANREP which is a program to manage budget of local government. System network between the central server in DCC and the finance division in the central government is not liked so that data collection should be regularly acted as soft-copy

The server configuration is consisted of 2 servers with HP Proliant-level, and EPICOR which is operating in local governments has 4 servers

System Name	System Function(related business)	Operating Method	Linked System	Server Name	OS	Server Number
EPICOR	Revenue receipt record mgt. Expenditure record mgt.	C/S	PLANRE P	HP DL 380 HP ML 370	Windows Server 2003	2

Table 16: Common status of EPICOR

EPICOR's server specification is as follows:

Server	Useage	specifications
EPICOR SERVER	Backup Server and Primary Server	• Microsoft Window Server 2003 r2 • HP Proliant DL 380 G5 • Intel® Xeon ® CPU • 1.87.ghz 2.00.GB of RAM • HDD 146GB SCSI -Local Disk • Backup Data Tapes 72GB
INTERNET SERVER	Connected Server between EPICOR systems	• Microsoft Window Server 2003 r2 • Intel® Xeon ™ CPU • 5120@1.86ghz • 3.06.ghz 3.05.1.00 GB of RAM • HDD 36.4 GB ULTRA 320 SCSI-Local Disk • HP Proliant ML 370 G5

Table 17: EPICOR H/W Inventory

Application is a common SW package product developed by Softec from India, available functions are limited for the overall system functions, and furthermore there is none of professional system operators in reality. Most of system users and administrators do not understand system's functions so that causes recognizing and problem solving are hard to deal with.

3.2 MRECOM

- General status

As the other application system, MRECOM is a tax collecting system to manage tax payer using in Dar es salaam City Council (DCC), Kinondoni, Ilala and Temeke. The system was developed in 2007 under the TRA for effective implementation of tax collection, is currently operating in 4 City Councils. In case of Temeke, it took roughly

US\$ 45,000 to introduce system

There are several major functions to manage tax payer and status of tax collection, 12 public servants who in charge of tax collection are using this system in Temeke.

Council	Induced Year	Managing Dept.	Utilizing Dept.	User Number	Budget(US\$)
Temeke	2007	IT	Finance Revenue	12	45,000

Table 18: Common status of MRECOM

- Configuration of Application system

MRECOM is also implemented as the Client/Server configuration like EPICOR, is linking to GIS, but not connect to the central government.

It has 1 server (HP Proliant) and is using Windows 2003 as the OS.

System Name	System Function(related business)	Operating Method	Linked System	Server Name	OS	Server Number
MRECOM	To storage and retrieval of Taxpayers information and their payment status.	C/S	GIS	HP Proliant	Windows 2003	1

Table 19: MRECOM HW Inventory

Screen of MRECOM is as follows:

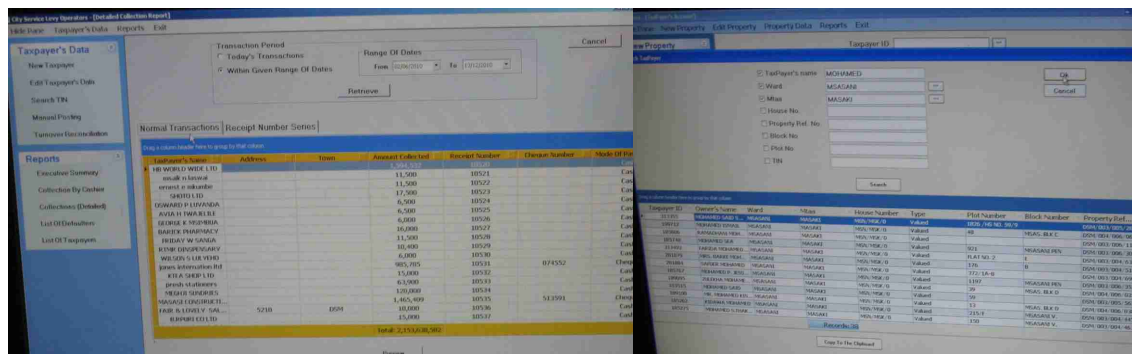


Figure 18: MRECOM system's screen

3.3 GIS (Geographical Information System) & MOLIS (Land Management System)

- General status

As the third application system, GIS was developed in 2007 under the Ministry of Lands, Housing and Human Settlements Developments and is to manage geographical information and tax payers using in four city councils such as Dar es salaam City Council (DCC), Kinondoni, Ilala and Temeke. it took roughly US\$ 26,000 to introduce system

Major function of GIS is to manage geographical information such as lands, housings. In addition, GIS is also using for establishing land plan, tax collection and other objectives in several divisions.

Under the MOLIS (Ministry of Lands, Housing and Human Settlements Developments), the system was developed in 2008 to manage land's lease and ownership information.

System Name	Induced Year	Managing Dept.	Utilizing Dept.	User Number	Budget(US\$)
GIS	2007	IT	All	Varies	26,000
MOLIS	2008	MINISTRY OF LAND	URBAN PLANNING	5	-

Table 20: Common status of GIS

- Configuration of Application system

Depart from other application system such as EPICOR, MRECOM, GIS is Stand-alone type, and connecting to MRECOM which is tax collecting management system; but does not link to the central government.

It has 1 server (Poweredge-level, produced by Dell), and is using Windows 2003 as the OS.

System Name	System Function(related business)	Operating Method	Linked System	Server Name	OS	Server Number
GIS	Identification of Property for revenue collection, eg land, houses, billboards.	Stand alone	MRECOM	DELL	Windows 2003	-
MOLIS	Management of Land rents	C/S	-	-	WIN XP	-

Table 21: Temeke GIS & MOLIS HW Inventory

GIS's Screen and Operation environment in a server room are as follows:

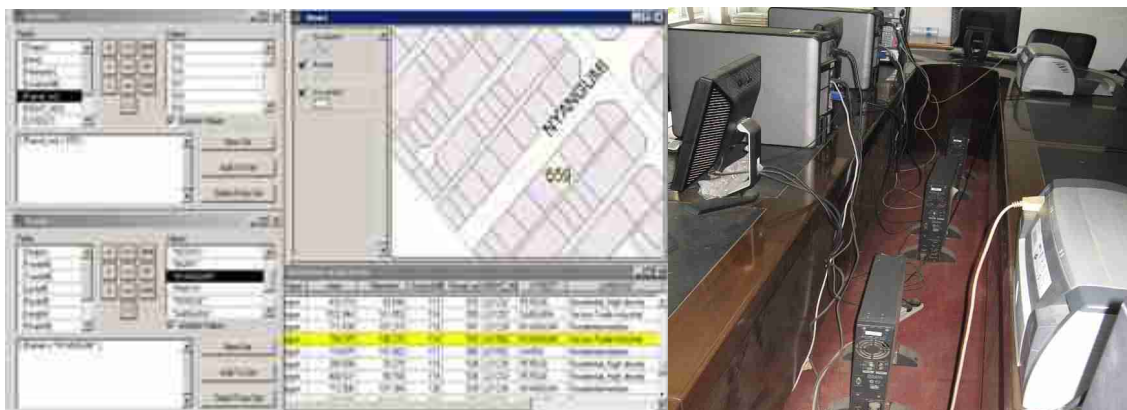


Figure 19: Ilala GIS Screenshot & Temeke GIS Room

3.4 Homepage

- General status

In the official web-site of Dar es Salaam, news and information related to administration, major policies, issues and procurement is provided. Some of documents can be downloaded, and limited searching function (only some major policies) is also provided. Otherwise, the site is also supported links to Municipalities and major government organizations, and links of task operation system (e.g. web-mail, file server) All information provided through the official web-site is mostly written in Swahili. Measuring it as the Web Measure Index model by UN, it can indicate the current status of national portal in Tanzania positions the second stage which is pointed out 'Enhanced Presence'.



Figure 20: DCC Homepage Evolution Stage

As one of criteria for measuring E-Government Evolution by UN, Web Measure Index is defined as the second stage which is 'Enhanced', and the definition level is as follows:

Stage II - Enhanced: Governments provide more information on public policy and governance. They have created links to archived information that is easily accessible to citizens, as for instance, documents, forms, reports, laws and regulations, and newsletters.

*Source: UN E-Government Survey 2008

4. The current status of IT infrastructure

4.1 Network Infrastructure

Currently, the number of PCs using in DCC is 80, 150 PCs are operating in Ilala and Kinodomy individually and in case of Temeke, only 50 PCs are using in there. Meanwhile, only 15~20% on the rate of PC usage is used for public tasks so that it needs to supply more PCs to increase effectiveness.

In 2004, LAN and WAN is currently operating in four City Councils including DCC, Network is linked to Headquarter of DCC, Karimjeehall, Fire station, Bus terminal in Ubungu, three Municipalities, and individual Municipality is connecting to Wards. As seen in the below N/W configuration (See Figure 21), LAN is configured with fixed line and wireless N/W is linked between DCC and three Municipalities. N/W equipments such as numerous switches, hub and one firewall are operated. However, it has risky factors as there is no security management system to secure N/W monitoring and to block harmful traffics.

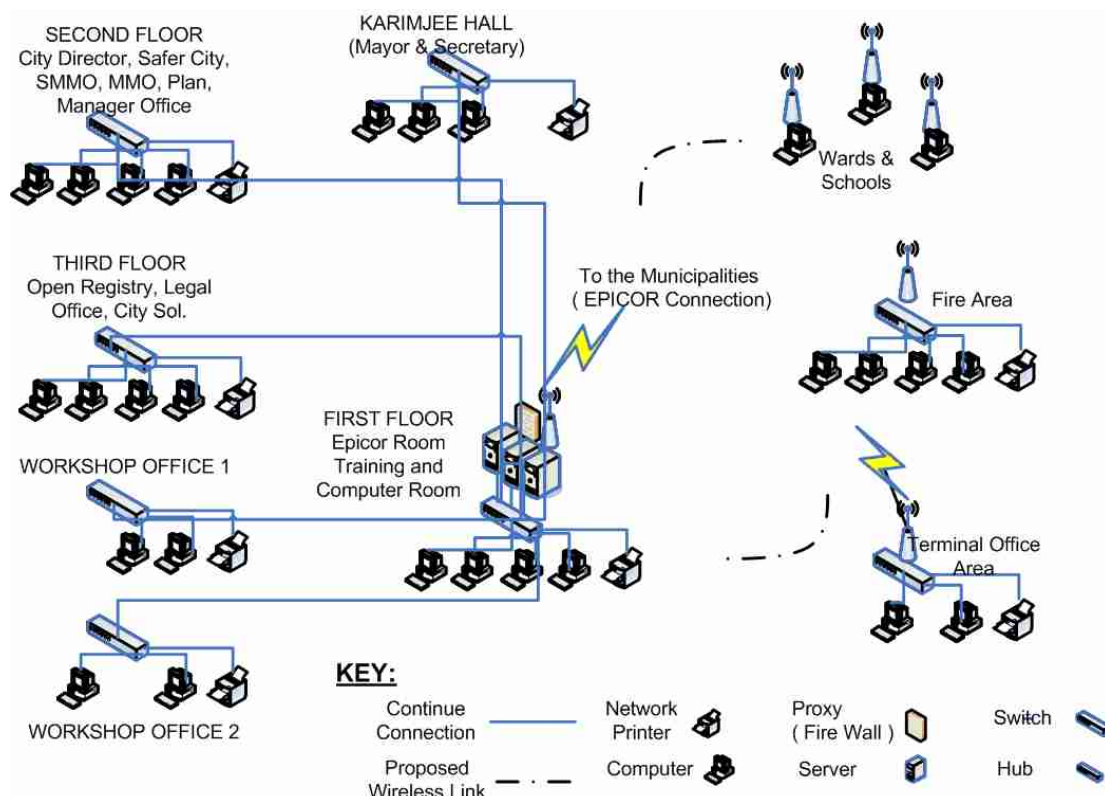


Figure 21: Network configuration of Dar es Salaam City Council

Due to the unmanaged N/W lines, some obstacles such as temporary disconnection by physical impacts might be frequently happened. Backbone network in DCC and line distribution within the office are as shown in Figure 22.

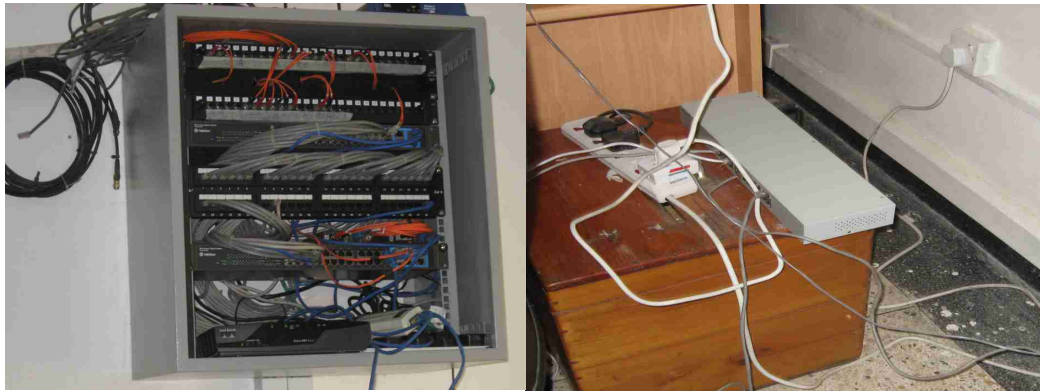


Figure 22: Network Backbone & Hub

4.2 Server Room

Basically, air conditioning and heating facilities are put in server room. The environment in the server room is unstable, there is no specific thermo-hygrostat or access-floor to prepare emergent situation so that external environment factors such as inflow of detrimental must, temperature and humidity change, and network disconnection are much fragile. In fact, adequate countermeasures are required to protect the system from physical impacts. Therefore, stable managing environments is crucially required to minimize the frequency of barrier.



Figure 23: EPICOR Server Room

In case of Tanzania, due to the insufficient power supply, frequent power cut has been happened during day time of summer season. Thus, the emergent generator is put in the district to prepare power-cut; but lots of cases not to be normally operated the generator are often occurred. The time during power-cut might be longer until tens of minutes at the least time or a matter of hours. For protecting this situation, UPS is secured in major system including EPICOR; however, it is normally used for just 15~30

minutes owing to the shortage of electricity capacity. Therefore, the adequate UPS having sufficient capacity should be considered for prepare this unstable electricity supply

5. The current status of IT Organization & Maintenance

5.1 IT Organization

As indicated in Table 21, the number of IT staffs working in four City Councils is 2~15 individually, and averagely 3~4 public servants are working. In DCC, one IT Manager and two IT Technicians who are charge of EPICOR system are consisted of IT organization within the office. This means that professional IT staffs to perform Informatization planning, operation, and its IT education are not enough. In addition, the amount of skilled staffs in local governments is also insufficient. Considering the scale of system in local area, the lack of skilled human resources is pointed out as the same issue in other local government organizations

	DCC	Ilala	Temeke	Kinondoni
IT Staff	2	3	4	15

Table 22: IT Staff Number

Meanwhile, depart form the problem of insufficient IT staffs, IT skill is another issue since considerable number of non-IT staffs and they do not have professional skills so that they are suffering from working the IS plan and operation, due to the lower recognition of IT systems. With this, it is hard to diagnose problems and handle them by themselves if any issues or barriers are occurred. In general, information system development and operation are progressed through outsourcing; however, due to insufficient budget to outsource, some of fundamental tasks are covered within internal resources in DCC. Therefore, capacity building pertinent to IT human resources is vitally required. In a long-term view, the capacity building of Informatization planning for effective and consistent project promotion is above all essential

The ICT unit's organization in Ilala is as follows:.

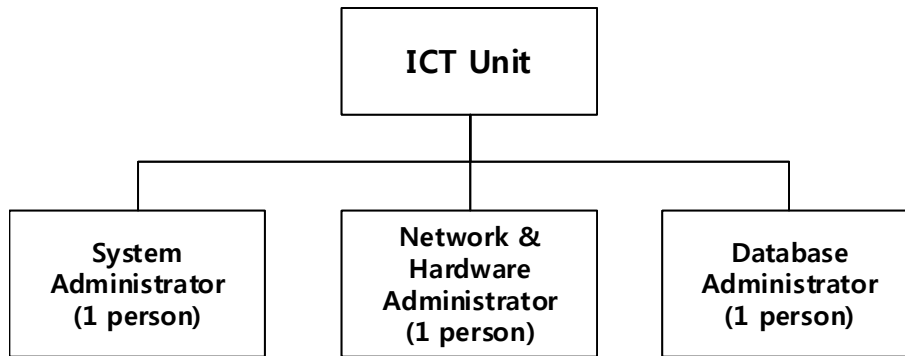


Figure 24: Ilala IT Organization

The task-force team for EPICOR system is operated in DCC and the only one member is charging the system in four councils, and handle with them with cooperation.

Major tasks of EPICOR system operation team are as follows:

- Maintenance of the system-WAN
- Electricity bills for keeping the system and Air conditioners running.
- Data tapes for daily backup
- Allowances for time administrator of the system.
- Safe lock for the Data tapes. 500 GB External HDD
- Generator incase of power failure.
- Computer sheet for printing cheque, salary slips
- Laptops for configuration incase failure to logon

5.2 Maintenance

Basically, system maintenance is dealt with in the internal IT division; however dealing with system obstacles generally outsource to private companies. In case of EPICOR and MOLIS, IT specialist as an envoy who is dispatched from the central government sometimes solves problems. The maintenance contract between private companies has normally time-based criteria per system obstacles. Adequate system maintenance supporting plan for practical system operation is required.

5.3 IT Budget

DCC does not secure the separate budget except the budget for EPICOR operation, and in general, about US\$ 100,000 is made up for IT budget in Municipality internally and externally. As the expected budget, approximately US\$ 33,000 per year takes for implementing a new system, thus it is not enough to adequate system implementation considering current administration task

Annual IT budget in Temeke is as seen in table

(USD)

Classification	2008	2009	2010
Establishment of information system	N/A	35,714	33,571
Maintenance Costs of information system	18,571	25,714	21,429
Internet Service Cost	5,429	10,857	10,857
H/W & S/W Purchase	N/A	13,571	14,286
Other	N/A	18,571	25,643
Total(\$)	N/A	104,429	105,786

Table 23: Temeke IT Budget

In case of EPICOR, budget for system operation is supported from the Ministry of Finance. The budget is used for system maintenance and costs of Internet circuit

Classification	2008	2009	2010
Establishment of information system	-	-	-
Maintenance Costs of information system	7,000	7,000	7,000
Internet Service Cost	7,200	7,200	7,000
H/W & S/W Purchase	-	-	-
Other	-	-	-
Total(US\$)	14,200	14,200	14,000

Table 24: DCC EPICOR Budget

6. Key Findings

As the result of current environment analysis, deducted Key Findings are as follows:

	Key Findings
Analysis of higher planning	• Internal capacity building is highlighted, e-Government initiatives are promoting for achieving the objectives
Business	• Considerable time and costs are required due to hand-writing process so that digitalized information system is crucially needed • Moreover, effective working process is also required through tools to support internal or external communication
Application	• Considering the level of users' IT skills, user-friendly system development (e.g. simplification) is essential • Improvement of task productivity through the official task supporting system (e.g. Groupware) is required • Enhancement of informatization effects is also required through information system linkage by minimizing offline tasks
Infra	• Higher N/W performance for improving operation environment of information system is required • Expansion of IT equipment (e.g. PC) to support the usage of information system is required • Securing extra electricity (e.g. UPS) to establish an electric supply system preparedness
IT Organization	• IT organization's capacity building is required • IT staffs' system operation capacity building is also required
IT Maintenance	• System maintenance process for stable operation of information systems is required • Arranging environments of information system operation (e.g. arranging server rooms) for minimizing system obstacles is required
IT Budget	• Requiring sufficient financial support for implementing new information system

Part 4. Case Study: SMG e- Government

- 1 Vision of SMG***
- 2 Development Phases***
- 3 e-Seoul Portal***
- 4 IT organization***
- 5 e-Government Concept and Model***

Part4. Case Study: SMG e-Government⁹

1. Vision of SMG

“Clean and Attractive Global City” is SMG’s vision. “Ubiquitous Seoul – The World’s Best e-Government.” SMG has been striving to enhance its brand value, improve the quality of citizens’ lives through ICT and strengthen the ICT-driven governance system. There are five main policy goals:

“City of Economy”, “Cultural City”, “Welfare City”, “Green City” and “City of Citizens.”

In order to achieve these goals, SMG will encourage public use of e-Services and enhance ICT governance structure while expanding and enhancing the currently operating e-Government systems continuously.



Figure 25: SMG e-Government vision

⁹ Unless otherwise specified, all subsequent references to this chapter refer to e-Seoul Master Plan, Seoul e-Government White Paper (2006), and the presentation material from SMG.

2. Development Phases

SMG embarked on building e-Seoul by establishing the “e-Seoul Master Plan” in 2003. The strategy aims to expand its ICT infrastructure, to enhance its customized applications, and to integrate systems to provide “collaborative interoperability” for government employees. This resulted in being able to provide comprehensive government services to citizens.



Figure 26: SMG e-Government Development Phases

In 2005, SMG expanded its online services dramatically. “One-Click Civil Petition Service” and the “e-Tax” system were launched so that the e-Government service level reached “transaction-enabled” phase. With new technological paradigm, SMG established “u-Seoul Master Plan.” in 2007.

The concept of Ubiquitous Computing – Ubiquitous refers to being everywhere as if the government services can be provided everywhere. As a pilot project SMG launched mobile technology and GIS-based services, in another word for location based services (LBS). For the future, SMG aims to become a world-recognized ubiquitous government by year 2010.

3. e-Seoul Portal

e-Seoul Portal is the single, trusted point-of-service for SMG, and it is one of the best e-Government portals in the world. The portal consists of 224 sites, providing several hundreds different types of information and services. Its annual visitors reached 6,715,531,¹⁰ in 2008, and SMG is continuously making effort to update and expand its services and contents.

The portal has 7 major features. First of all, the portal provides the user gateway for “citizen,” “business,” and “tourist” ① so that visitors can browse information quickly and easily. This feature is based on the Content Management Systems (CMS) and Customer Relation Management (CRM) technology that allow “user-centric” information browsing.



Figure 27: SMG e-Government homepage

Secondly, the portal provides service and information index ②⑥. Users can select categorized menu for quick information search and pre-defined customized information. In addition, providing frequently requested information makes easy for users.

For instance, users can click on “Find hospitals near you” to search for hospitals or public health centers. The portal will show hospitals on a map using the registered user

10 2009 Seoul e-Government Plan (pp.14)

information. Third, users can search the integrated database for information and services. ③ Forth, the portal can be viewed in 7 different languages: Korean, English, Japanese, Chinese(2), French, and Spanish. ④. Fifth, latest news, information, announcement can be viewed in real-time ⑤. Finally, citizens can directly write a message or send an e-mail to the mayor. ⑦

4. IT organization

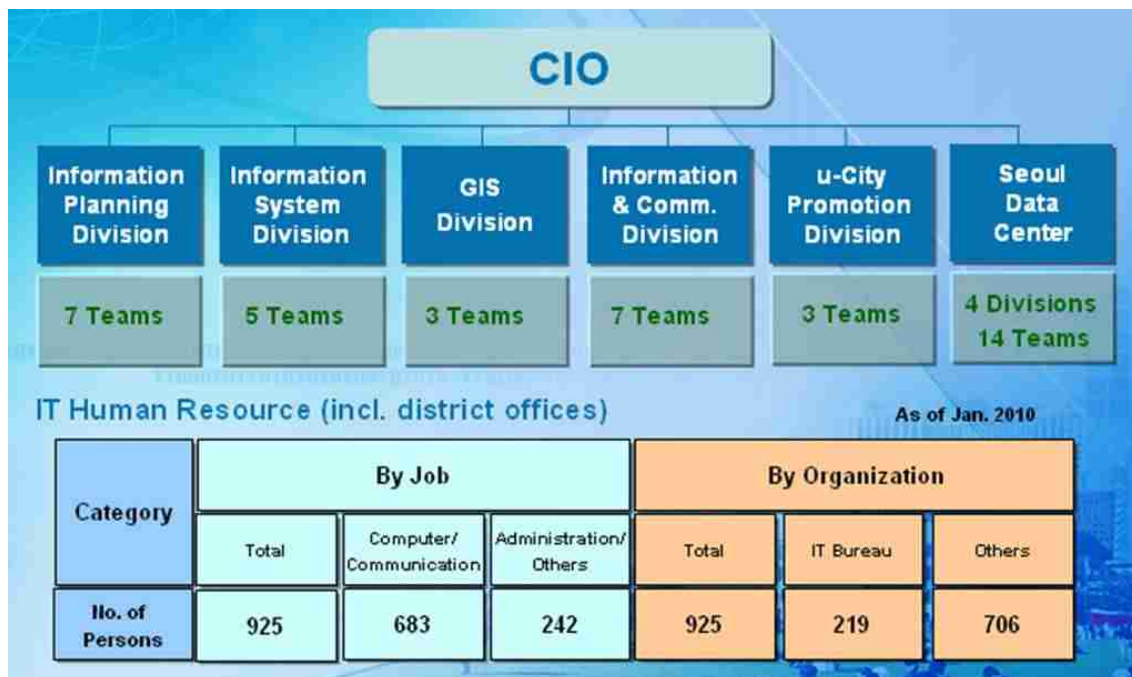


Figure 28: SMG IT organization

Under the leadership of the CIO, the Information System Planning Bureau is divided into five divisions: Information Planning Division, Information System Division, GIS Division, Information & Communication Division, and u-City Promotion Division. The divisions are divided into 24 teams, and currently there are 603 employees. (Including employees in all 25 district offices – numbers are IT employees) It is important to state that the organization has planning, maintenance and operation units separately, and the percentage of technicians and administrative staffs should be somewhat balanced.

5. e-Government Concept and Model

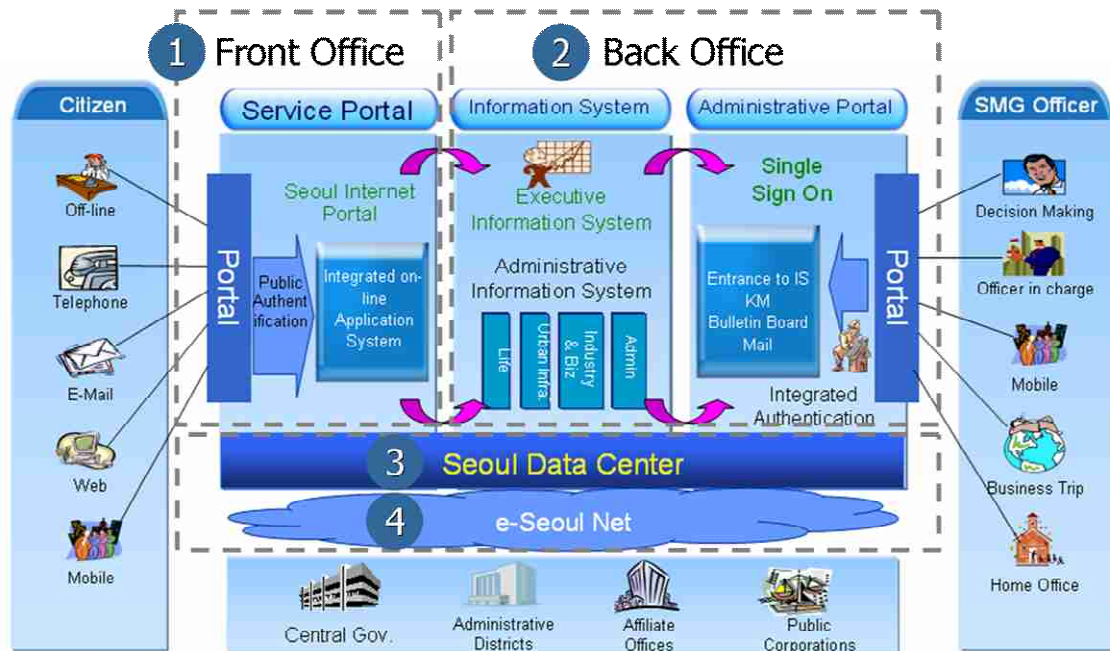


Figure 29: SMG e-Government model

Various channels and service homepage and gateways for e-Services these all explain the front office. Citizens are able to receive the same service via web, KIOSK, phone, FAX, and even with a cellular phone. In order to provide all the government services online and offline, developing and maintaining the customized systems for the government employees are necessary. These customized applications are the “back office systems,” and it needs to be accessed through the internal portal.

Single-Sign-On (SSO) is an important component of the internal portal for user access control. With the internal portal, the government employees are able to exchange and to share various information using e-mail, bulletin board, instant messenger, and knowledge management functions. In addition, the portal should be integrated with Electronic Document Management System (EDMS) or e-Document management system.

Some of the detailed information regarding front and back office follows.

5.1 Front Office (Service for Citizen)

Front office enables citizens to use administrative information through the internet without visiting to public offices. Seoul provides citizens with services through 191 sites of 13 major areas such as Main menu, Culture and Tourism, Administration, Informatization, PR, Industry/Consumer, Woman/Youth, Health/Welfare, Environment, Construction/Urban planning, Housing, Transportation, Informatization.

Section	Main functions (Citizen Services)
Information provision through the internet	▪ News on municipal affairs – Hi Seoul news (Seoul city news & News release) – Notice – Monthly news ▪ Living information – Health – Housing information – Clean Seoul – Transportation – Women – Leisure ▪ Administrative information – Major projects – Open administrative information – Budget – Statistical Data – Administrative information archive ▪ Introduction to Seoul – Mayor's office – Seoul history museum – Image of Seoul – Seoul guide
Administrative service through the internet	▪ e-application – Guide and counsel, Civil application and confirmation – Tax query and payment, Query of report/audit – Public service reservation – Query of counsel/report history
Civil participation through the internet	– Idea suggestions – Discussion – Free board – Community

Table 25: Citizen Services

- SMG external portal has developed into the ones providing two-way interactive services and opening information at the request of citizens.
- Citizens can download a civil application form and pay taxes on homepages. Since May 2007, Seoul started to offer mobile services on its mobile portal (mSeoul702) by which citizens can suggest ideas, information regarding transportation, air quality, culture, municipalities are available, and even facility reservation can be made with a cell phone.
- Front office system should be a one-stop application in connection with back office. In addition, an area for public participation and a monitoring system should be also offered continuously.

5.2 Back Office (Groupware and Administrative System)

Back office system can be divided into five major categories: General Civil Affairs, Office Automation (Groupware), EDMS (Electronic Document Management System), KMS (Knowledge Management System), Public Administration Information, and finally City infra Information.

And the system were classified into 16 subordinate functions including municipal planning, IT, PR, audit, personnel, finance, administration, urban planning, housing, fire fighting, construction, transportation, culture, welfare/ women, environments, and industry.

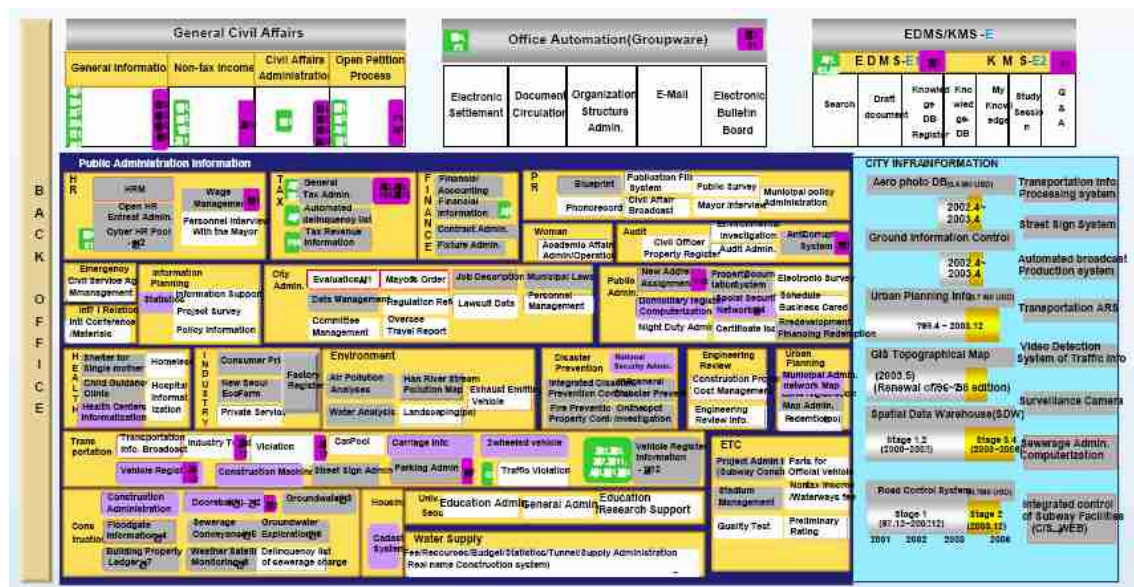


Figure 30: SMG Back Office Systems

Electronic approval system has been introduced since 1991. The SMG and 25 autonomous districts have started to utilize electronic document system or EDA regardless system types since 2002. Now, all works are connected to electronic approval system with hierarchical approval procedure. The rates of information sharing and work efficiency have greatly increased. (All approval process is electronically conducted)

In addition, electronic approval system is connected with administrative information system such as OPEN system (Online Procedures ENhancement for Civil Applications) e-personnel administration, and thereby simplifying the overall approval process.

In 2006, Seoul web portal was established for the efficient management of electronic approval, e-mail, messenger, community, bulletin board, and Blog.

Since 2007, Seoul has focused on the systematical analysis and systemization of work process through administrative systemization projects, not developing an individual system for each area.

5.3 Data Center

The Seoul Data Center is a major infrastructure where all kinds of information resources related to Seoul e-Government system are managed and processed.

Since 2003, integration and networking of information resources has started while computer system room has expanded on February 2nd 2004 when information resources and systems, which used to be managed by each division, were moved into it, the Seoul Data Center has launched.

For the purpose of realizing competitive e-Government system, SMG has provided citizens with various services and developed information systems throughout the overall administration. However, it is about time that SMG sought the turning point quality-wise to accomplish its vision and role which is "World best intelligent city satisfying the citizens."

The biggest problem was that it is difficult to run high-quality e-Government services stably 24/7 due to information resources scattered to each division.

As more information resources were gathered, the necessity for minimizing total cost of operation (TCO), which is on the increase, and accomplishing the greatest effects arose.

Therefore, Seoul has embarked on building a Data Center where separately-managed information resources could be integrated with large-capacity processors,

advanced management systems. Indeed, Seoul Data Center has become a forum for professional management of resources through the integration of various information resources, automated management system, and a Standard Operating Procedure (SOP).

Meanwhile, Seoul needed to upgrade its way of providing services for citizens who are high internet users in order to attract more users and to increase citizens' satisfaction. In an effort to meeting the needs of citizens, SMG has launched a call center in Data Center to upgrade the quality of e-Government system.

5.3.1. Data Center facility

SMG has expanded the existing system room to 893m² to stably run information systems. The expanded system room of which the floor and the ceiling are water-proof has high-tech devices such as monitoring cameras, finger print recognition system etc.

5.3.2. Control room

In control room, ten 50-inch DLPs are installed to show how the system runs so that all facilities and systems can be monitored around the clock. Auditorium is prepared to have a meeting in case of emergency.



[Control room]



[Auditorium]



[Meeting]

Figure 31: Control room and Auditorium

5.3.3. Integrated information management system

Integrated information management systems such as SMS (System Management System), APM (Application Performance Management), and FMS (Facility Management System) run in the Seoul Data Center. And each system mentioned above is interconnected to be comprehensively handled.



Figure 32: Data Center

5.3.4. Integration of information resources

132 servers were moved into the Data Center and interconnected with each other for the seamless system operation.

5.3.5. Help Desk

The help desk in the Data Center plays as a single window of counseling on problems related to services and system breakdowns. The SMG has witnessed the rapidly increasing satisfaction rates on the system fully armed with professionals. An average of 75 counseling cases are recorded a day.

5.4 e-Seoul Net

Since 2003, Seoul has been operating e-Seoul net, which is an information highway connecting 36 major municipal agencies with optical fiber cables along the subway tunnels.

e-Seoul Net increases the convenience, cost-efficiency of the integrated network management and thereby contributing to boosting citizens' trust. Moreover, real-time information sharing and broadband information transfer is possible through e-Seoul Net. In addition, N/W Operation Center (e-SNOC) manages real-time operation of systems such as administrative information network, administrative telephone network, and office automation.

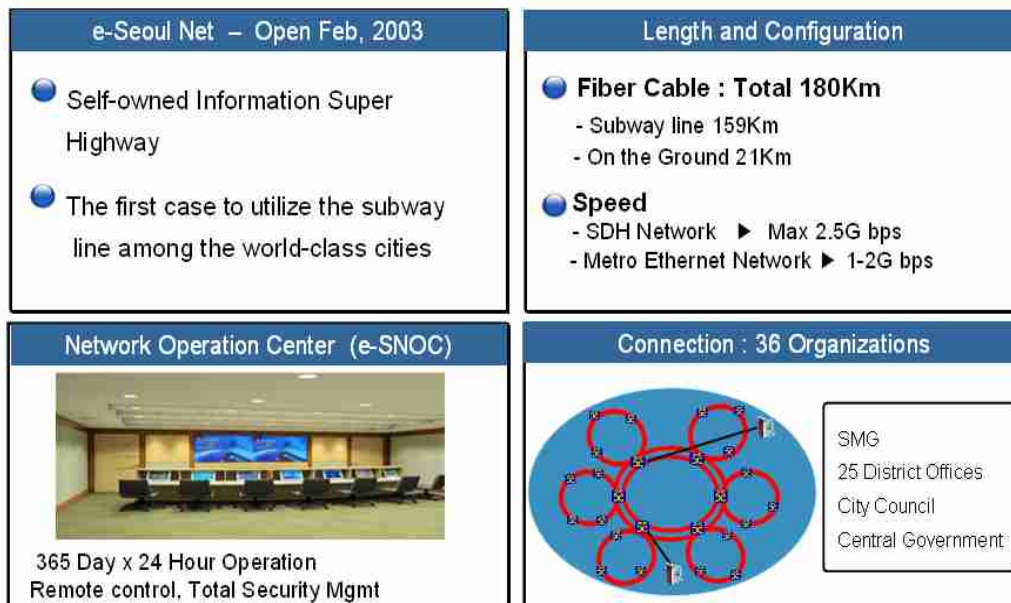


Figure 33: e-Seoul Net

- Transmit large-sized administrative contents and multimedia data
- Strengthen security against virus and hacking by unifying access points to the external Internet
- Enhance data backup function through Integrated Data Library and Disaster/Failure Recovery System
- Reduce cost using the high-speed communication network

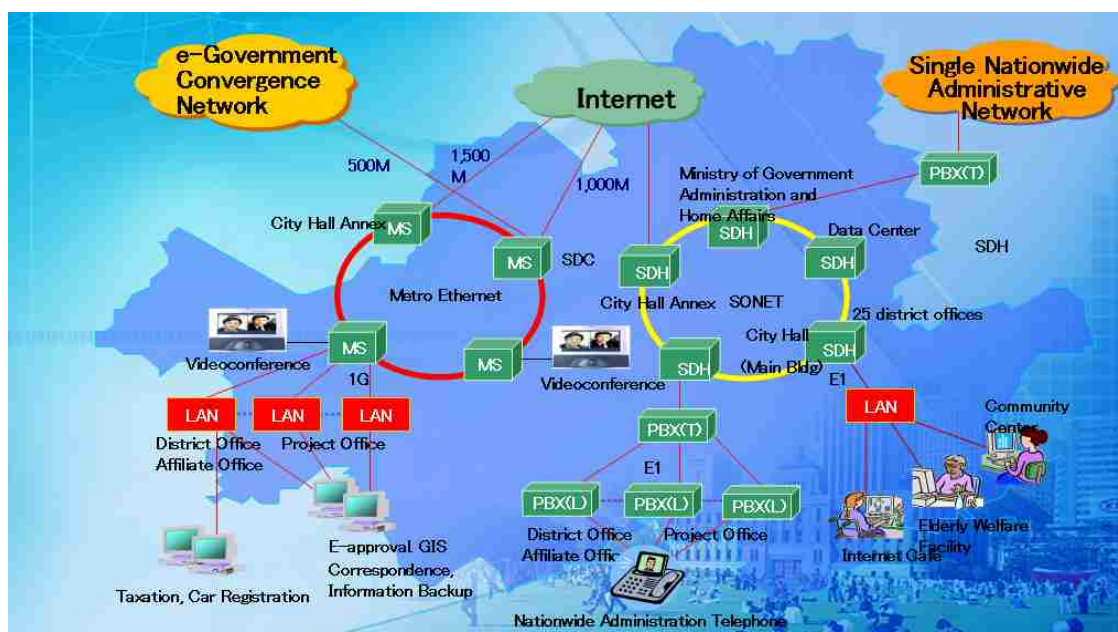


Figure 34: Diagram of e-Seoul Net

The foundation of the e-Government of Seoul, e-Seoul Net connects each and every government agency in the entire city. The e-Seoul net is an exclusive communication network laid along the city's subway tunnels for interconnecting all the umbrella agencies in the SMG.

SMG is operating credible network establishing e-Seoul Net – broadband ultrahigh speed information network to link major 36 administration organizations as fiber cable network utilizing subway lines in the year 2003.

Establishment directives of e-Seoul Net are easiness of network integration management, credibility, enlargement, using convenience and economical efficiency

e-Seoul Net has enabled real-time data sharing as well broadband data transfer request's reacting because it has been changed as self-owned ultrahigh speed fiber communication network. Information management offices with computers are operating integrating internet, district administrative information network, administration telephone network and office automation to be operated by existent regions. The results that were gained due to the launch of the Seoul Data Center are as follows.

- First, in terms of strategy, information infrastructure has been dramatically raised due to the systematic integration of information resources and improved computer systems. For the first time among public organizations, SMG has secured professional human talents who operate the system, opened the Data Center, automated the management system, allocated resources most properly, and therefore ensuring information security. Such efforts are now drawing the attention of many domestic and foreign people who want to benchmark the accomplishments.
- Second, in the service-wise, SMG has improved its service quality by operating systems around the clock, minimizing the rate of system error, and thereby providing citizens with stable services. After the establishment of the Data Center, the rate of system error has decreased by 76 percent. Also a more sound foundation has been prepared for upgraded e-Government system thanks to the help desk by which the satisfaction of citizens and SMG officials is improved.
- Third, in the economic aspect, economy of scale is realized due to basic infrastructure sharing and cost reduction. When building its Data Center, Seoul was able to save up about 2.1 billion won by remodeling the existing facilities. Furthermore, as the maintenance rate has decreased by 2 to 3 percent due to an integrated maintenance contract, the budget for system operation and maintenance has been reduced by 800 million won in 2004 and by 300 million won every year since 2005.

- Fourth, in the management aspect, systematic and technology-intensive operation framework has been prepared by adopting the latest know-how such as SMS, SOP, and SLA. In addition, information security has been tightened up while large-scale integrated back-up facilities enhanced the efficiency of information protection and resource management.

Part 5. To-Be model and Strategy

- 1 Approach & directions***
- 2 To-Be model***
- 3 Informatization Strategies***
- 4 Establishing informatization master plan***
- 5 Establishment of e-office environment***
- 6 Modernizing of IT infrastructure***
- 7 Strengthen of IT organization capacity***

Part5. To-Be model and Strategy

1. Approach & directions

1.1 Summary and Implications

1.1.1 Environment assessment

- According to the E-Gov. Development Index, as a noticeable low-level comparing to other among African countries, the current status of Tanzania e-Government is in an initial stage to start emerging e-Government development
- However, technical Informatization status in Tanzania is only concentrated on Dar es Salaam; on the other hand, other areas including Dodoma which is political and administrative capital are underdeveloped.
- In a technical aspect, major causes to be underdeveloped are as follows:
 - Absence of robust, government-wide ICT Infrastructure
 - Insufficient ICT Capacity
 - Lack of skilled Human Resources to operate ICT systems
 - Lack of sustainable Educational Programmes
 - Low level of ICT understanding
 - Weak security management system
- Due to the shortage of administrators to understand and operate ICT systems, working process is still staying down to write in hand
- Despite of some reasons to be underdeveloped, several potentials for growing are as follows:
 - Increment of ICT needs and interests with going up the demand of ICT usage
 - Central Government's strong will
 - Recognition of the necessity of ICT
- Generally seeing in a holistic angle, they fully have potential opportunities to let their e-Government grow on the base of government efforts and necessity to change

1.1.2 Current status analysis

- Dar es Salaam has promoted e-Government initiatives with establishing an objective to build up internal capacity and implement effective task proves until 2013
- One of important role of Dar es Salaam is providing public service in G2C to citizen,

and for this, specific role and responsibility between City Council and Municipality Council are classified.

- Firstly, practical administration services (e.g. education, hygiene, refuse disposal, etc) are handled by Municipal Council, and the municipality council is in charge of project progressing for developing of individual fields
- Secondly, City Council is upper level of organization, and has a responsibility to arbitrate and plan tasks between Municipal Councils, and to have in charge of legal system interpretation and regulation examination of the central government to supervise subordinate agencies
- Municipal Council is as the practical performing organization, they secure the internal budget by themselves through tax collecting, thus the accuracy and transparency of tax collection is crucial issue.
- Due to the absence of collaboration system or its process between central council and lots of subordinate agencies (e.g. ward offices educational institution, etc), contacts by telephone is only mean to cooperate tasks so that the effective cooperation process is essentially required
- Considering users' IT knowledge and skill-level, simplified functions and user-friendly system development are needed, above all enhancement of task performance through the public task supporting system is essentially required
- By minimizing offline works through connecting to information system, it needs to extend Informatization effects
- In case of infrastructure, for improving IS environment, network performance and PC distribution are required, and the extra electricity supply (e.g. UPS) to supplement insufficient power is also required; In addition, aligning server-room to minimize barriers is required as well.
- In IT organization and operation, maintenance process should be established and capacity building is ought to reinforced to handle obstacles and barriers internally
- Lastly, financial resources for implementing a new information is crucial before anything

1.2 Informatization level assessment

By assessing the current Informatization level in Dar es Salaam with “Government formation’s change from Gartner’ four phase Model”, this Tanzania F/S would review the strategic direction for Dar es Salaam e-Government.

- Definition of Informatization level in Dar es Salaam through the Gartner Model

Gartner, an international consultancy firm, has formulated a four phase e-government model. Garner's four phases shows Government formation change owing to Government's informatization & revolution.

- The stage I ("Presence" status): in the first stage, e-Government generally provides organization's role, email information, address, and opening time for public services. Normally those information are provided by one-way in cyber placeholder, but not a level of portal website
- The stage II ("Interaction" status): e-Government in the second stage provides fundamental searching function, download forms, linking service to other organization besides organization and civil servants' email address. Distinguished feature between stage I and II is website implementation (normally, official government portal site) Therefore, people can access to the government portal site and are able to be provided public services through the Internet
- The stage III ("Transaction" status): in a following step, people can deal with public services and transactions through online, and it features to utilize linking function to other service channels
- The stage IV ("Transformation" status): As the higher goal of e-Government, government desire to orient this step. In this stage, government newly identifies public services and methods in G2C for implementing the transparent government system by providing single point

This model reflects the international trend of innovation in government model. The changes are from a government-driven model which focuses on disseminating information unilaterally to a customer-driven model which focuses on related and sharing of information to provide a service that government and citizens interact each other.

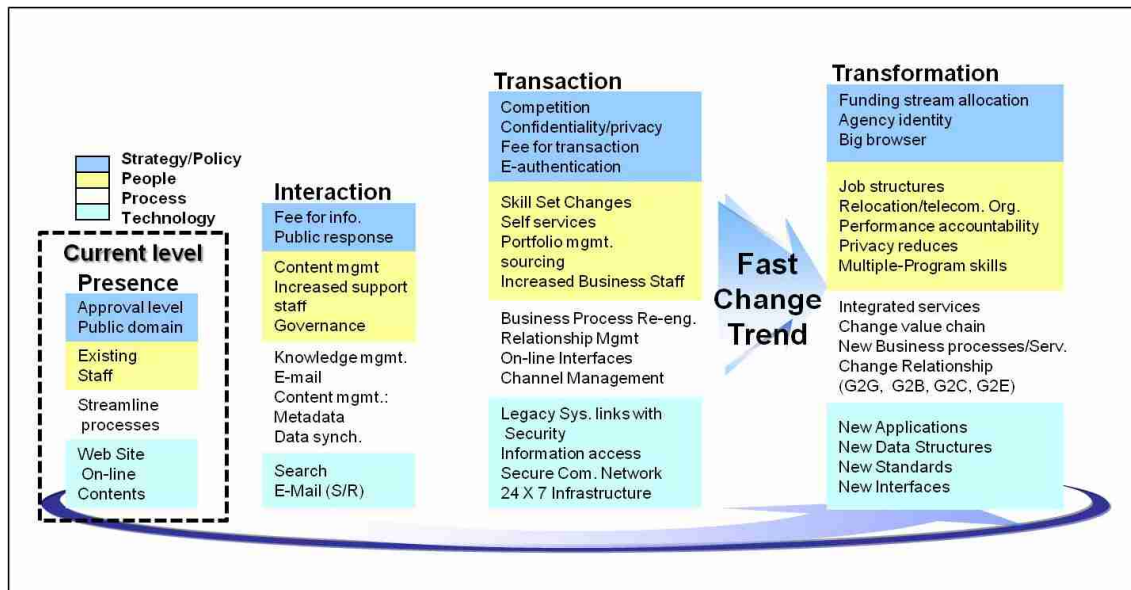


Figure 35: Dar es Salaam e-government level assessment

Considering information level provided by official homepage, working process, and Informatization organization system, it could be indicated that the level of e-Government in Dar es Salaam is currently positioning at the first stage which is “Presence” level. In addition, some data and related organization links are also provided so that some parts of “Interaction” function are implemented, but not yet generalized. Most of public works are highly rely on papers written in hands. As a result, the current level of e-Government in Dar es Salaam is identified as the “Presence Level” due to the absence of knowledge-based working process and inferior Informatization environments.

- Implications in Dar es Salaam considering Gartner

Considering the Gartner Model, first of all knowledge-based tasks process and its management system are fundamentally required to implement higher e-Government system. For this, Collaboration tool should be basically secured and through this, cooperation process implementation among members of organizations is essential.

Further, Dar es Salaam ought to secure sustainable e-Government promoting system, establish educational process for public servants in organizations

1.3 e-Government’s strategy direction

Based on the Informatization promoting experiences in Seoul Metropolitan Government (SMG), Dar es Salaam would set the desired informatization model with establishing optimized promoting.

- E-Government Model and Direction of Seoul Metropolitan Government

The concept of e-Government can be compared with "online administrative service" such as ATMs which were installed in business areas (shopping malls, department stores, etc.) in 1993 when the Clinton administration implemented its Information Superhighway Project. Since 1999, the policy has focused on one-stop civil service and access to enhance the quality of services, and led to earnest deliberation on the concept of e-Government. Finally, the US government declared the "Era of e-Government" in June, 2000.

As for e-Seoul Government, the city government also formulated its digital governance roadmap, a step-by-step plan to achieving the world's best e-government, in the 1990s.

By the year 2009, although the (SMG) developed about 200 kinds of administrative systems and 150 web-sites to provide online services, it still fell short of citizens' expectations on better and more diverse public services. Services remained governmental agency-centered instead of citizen-centered due to the lack of networking among systems and services.

To deal with those problems, SMG shifted its paradigm from system installation and quantitative expansion to system utilization and qualitative growth, pursuing systematic implementation of its informatization project.

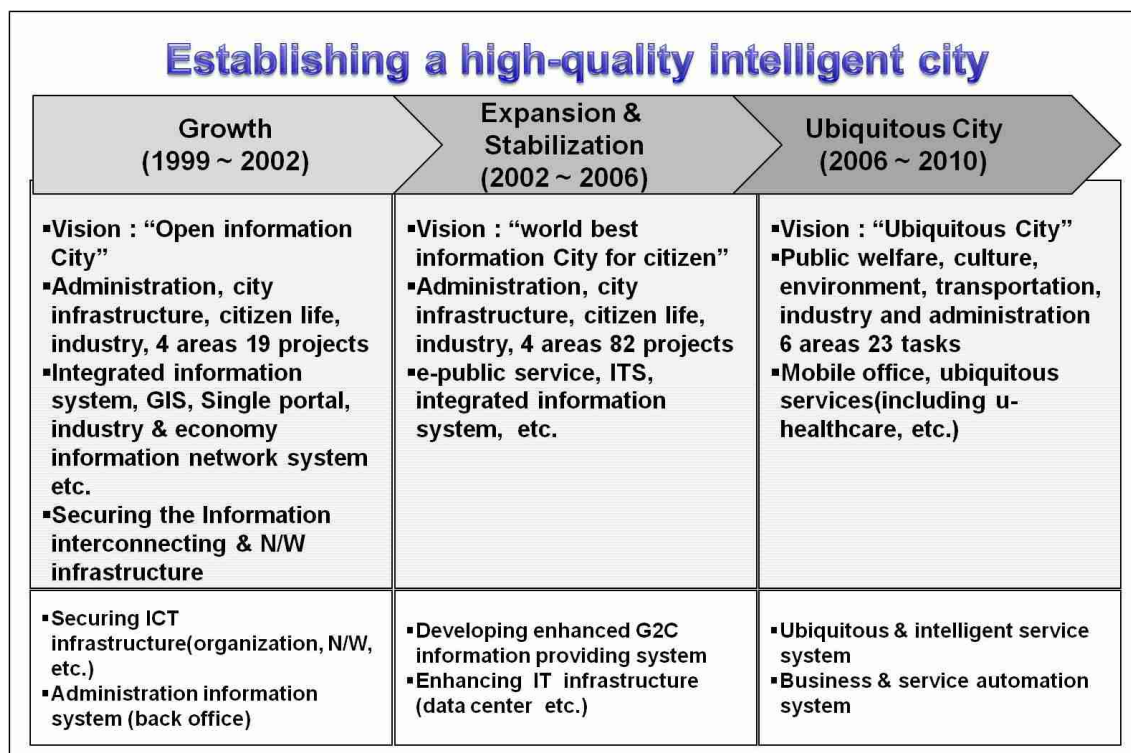


Figure 36: Seoul e-government development model

Seeing the Informatization development model of SMG, the “Growth” stage which is the first step, had developed with concept to secure informatization infrastructure and focus on public administration system. Afterwards, the model was progressed to have a direction developing single task and service system. This would be similar with Gartner’s e-Government development model, after securing fundamental infrastructure and public administration system are implemented and then the model will strengthen G2C services and automation of each single tasks as the following steps.

- E-Government direction in Dar es Salaam

Considering the Gartner Model and the direction of Seoul city’s model benchmarked earlier, the direction in Dar es Salaam could be identified as below:

- **Implementing knowledge-based working environments through cooperation:**
EP (Enterprise Portal), Groupware, EDMS (Electronic Documents Management System) implementation
- **Reinforcing e-Government infrastructure:** e-Government to extend internal network and to secure security
- **Building up the Informatization capacity:** promote education / training programmes and practical IT organization to build up human resources capacity

2. To-Be model

“Business transformation” often refers to within an organization, aligning people, process and technology to support business strategies and to realize its vision. Most importantly, IT serves as a catalyst for “transforming” traditional work handling methods, processes, and practices. Paper-based work processes must be transformed into the integrated IT-enabled high-performance working environment.

The original objectives of e-Government services are to enhance the effectiveness of administration tasks and convenience of citizen’s living environments. Therefore, when e-Government initiatives are promoted, it is adequate to consider service providing, administrative informatization and working process automation, lastly infrastructure implementation all together. However, for providing e-Government services to citizen, administrative informatization, automation of working process and infrastructure implementation should be enacted before anything.

In case of Dar es Salaam, considering the status of current IT infrastructure, working process and the members' informatization properties related to ICT and e-Government, the effectiveness of working process through automated task process should be reminded and enhancing the access to information by securing IT infrastructure and equipments ought to be preceded.

For this, e-Government model in Dar es Salaam is as follow:

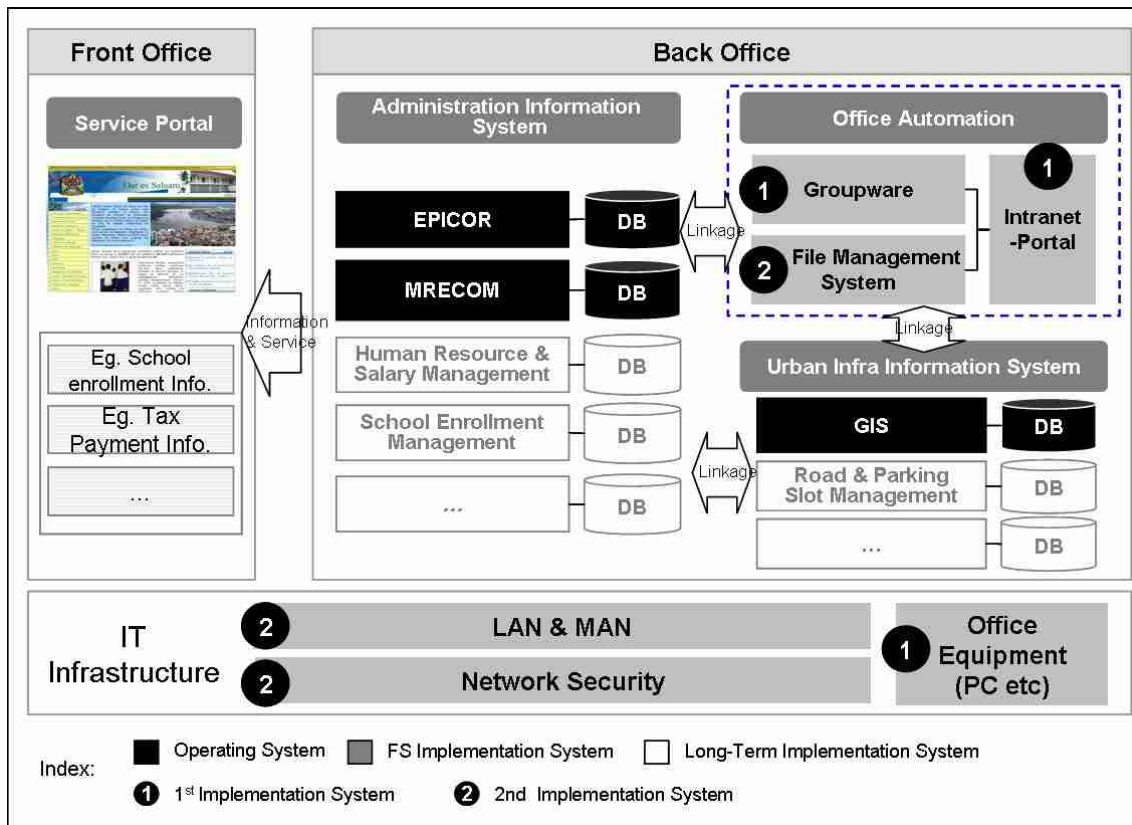


Figure 37: To-Be Model

Above To-Be model illustrates that the DMC should consider developing and aligning three major areas: front office, back office systems, and IT infrastructure. Most importantly, it is recommended to focus on the back office systems and infrastructure.

3. Informatization Strategies

To achieve above To-Be image, F/S consultants recommends following three strategies & five Implementation tasks.

Informatization strategies	Objectives	Promoting Tasks
Collaborated strategy planning	▪ Establishment for Informatization strategy planning ▪ Innovation of Working process through task process improvement	▪ Establishing BPR/ISP
Electronic working environment implementation	▪ Enhancement of task effectiveness ▪ Improving the effectiveness of communication between organization	▪ Implementing Groupware and Portal site for public tasks ▪ Implementing EDMS
Strengthening of IT Infrastructure	▪ Increasing the chances of information access ▪ Managing stable environment for using continuous connected system	▪ Expending LAN & MAN implementation and PC distribution ▪ Tightening up N/W security
Building up the capacity of IT organization	▪ Building up the capacity for promoting e-Government initiatives ▪ Reinforcing human resource capacity for system operation	▪ Strengthening IT organization and building up the IT staffs' skill

Table 26: Informatization Strategy and Promoting Tasks

4. Establishing Informatization master plan

4.1 Public Administration Process Re-engineering

The tasks of the DCC have more mutually independent structure than interrelated structure. Re-engineering consulting on public administration process is prioritized in order to analyze and diagnose to uncover whether or not current process is a suitable structure for city administration tasks and to formulate schemes for reorganizing manpower and more efficient structure, if any.

The reformation of public administration through information technology is generally called Public Administration Process Re-engineering (PAPR) and it provides an epochal opportunity for improving administration service of government and reducing administration performance cost.

PAPR is to reconsider and to mend the process of a task to achieve dramatic improvement on core outcomes, such as cost, quality, service and speed. PAPR is to dismiss all the existing processes and to perform new processes via using information technology.

Information technology is the fundamental method that makes PAPR possible to be substantially utilized and acts as a tool to operate re-engineered process. Information technology enables process to proceed and advanced process contributes to improving task performance of organization. Information technology presents possibility of re-engineering of administration process by providing opportunity of automatization, integration and elimination of medium. At the same time, information technology provides modeling tool for analyzing process.

4.2 Information Strategy Planning

Current structured informatization status of the DCC is about 80 desktops. In addition, the requests for introducing application system and information system equipments by each department are mounting. It is, however, apparent from an interview of actual inspection that there is no experience of devising plans to introduce informatization. In this case, unplanned and sporadic information system could be introduced and implemented without a long-term plan in the circumstance of radical changes of information technology and business environments, therefore systematized preparation is needed. For matters mentioned above, the Information Strategy Plan needs to proceed.

This Information Strategy Planning (ISP) defines procedures and component parts in

order to formulate information system plan, and prescribes necessary implements, techniques and guides for its operation. ISP being the most interesting part of information system area, the purpose is to build efficient and consistent system in the long-term by providing information architecture for implementing necessary information system to ensure efficient public services and smooth public administration process of the city.

The ISP makes it possible to maximize its effects as to progress of informatization and to efficiently utilize limited resources of departments as well. The ISP develops according to over all outlooks which prevents duplicated investments on the identical system and omitting a necessary system form informatization objects. In addition, the ISP guarantees integration between to-be-developed systems in the next years and secures mutual connection of each system as informatization gains ground, with contextual consideration. The ISP is the very important task not only to private enterprises, but also to public institutions. Competitiveness of private enterprises or citizens will be supported by improving the interior productivity of public institution and elevating the quality of services through utilizing information technology.

5. Establishment of e-office environment

5.1 Establishment of Groupware & Enterprise Portal

A groupware will increase communication speed and change organizational culture. Though DMC has a web site with its own domain name, it appears that government employees use public e-mail services with various internet portal services such as Yahoo and Google rather than having its own e-mail services.

According to a number of research institutions, the groupware technology reached it's very stable stage that there are various off-the-shelf products available at the market. To make easy for DMC employees, it is necessary to customize its functions.

Following describes in detail regarding the groupware and enterprise portal.

System functions and description		
level1	level2	Description
Groupware Service	E-mail	▪ Receives and sends internal mail and web mail. ▪ Develops mail message, retrieve and search, external mail box, mail box management, etc.
	Electronic Approval	▪ Template registration, document development, document printing, approval processing, document receipt and sending, document storing and archiving, etc.
	Electronic Bulletin Board	▪ Develops message to post on the Bulletin Board, search, time-set posting, Bulletin Board management, etc.
	Task Management	▪ Task introduction history management ▪ Task context management ▪ Task performance management
	File Server	▪ Data systematic management ▪ Setting authority for access to data ▪ Data registering and searching
	Resource Management	▪ Resource registration, retrieval & reservation, review, etc.

System functions and description		
level1	level2	Description
	Community Management	Registers same-taste association, Bulletin Board, Data Room, search, membership management, etc.
	Personal Information Management Service	Individual & group schedule management, address book management, etc.
	LDAP/ Organization Management	Retrieve internal and external user information, manage organization chart, etc.
	Survey	Develops survey, view respondents, automated statistical processing, etc.
	Full Text Retrieval	Natural language/ subject word search, index, dictionary management, etc.
	Short Messaging Service (SMS)	Recipient designation, message development and transmission, etc.
Enterprise Portal Service	Integration	Develops universal UI(User Interface) when users access business information, Integrates all information, internal system of district (legacy), menu function in the united web through a unitary gateway
	Personalization	Organizes characterized information for individuals/sections, organize personalized contents for individual's tasks and roles
	Administration Support	Provides necessary internal contents for administrative tasks: direction, work instruction, regulations, etc.

Table 27: Groupware & EP functional description

5.2 Establishment of File Management System

Developing file management system for DMC is another important component. Years ago, creating a paper-less working environment was a number one issue in many municipalities around the world. In fact, developing the file management system does not the same as scanning all the paper-based documents. DMC must establish

electronic document standard format and proper exchanging processes to maximize the basic functions of the system. e-Document achieves will be established, and this system will dramatically change the way of handling most documents within DMC.

Following describes in detail regarding the file management system.

System functions and description		
level1	level2	Description
File (Document) Management system	Document registration	▪ Provides to create new documents or open existing documents from the system
	Version management	▪ Classifies document by the modification rates when the document is created, modified, or registered. ▪ It enables to attach the special version labels so that every history of the document is searchable.
	Check-In/Out	▪ Provides a lock function while modifying so that an unauthorized personnel may not access contents to modify
	Security management	▪ Enables to create access authorization on every area including registered contents, workflow, etc.
	Audit Trail	▪ Manages all document access related system event, check-In/out, reading, deleting, workflow, etc., by log
	Workflow	▪ Systemizes user-centric work process. ▪ Provides graphical workflow
	Renditions	▪ Automatically creates and saves all types of content files (PDF, HTML, TIFF, DWF, etc.) ▪ Runs suitable views and tools according to user's circumstances
Back-up System	Searching	▪ Provides the extensive search functions: words, synonyms, system search, logic and arithmetic operation, and accurate search
	File Back-up	▪ Documents and Data Backup

Table 28: FMS functional description

6. Modernizing of IT infrastructure

6.1 LAN & MAN extended implementation & PC distribution

Building a LAN, distributing PCs should be considered a must have for establishing e-Government at the DMC. Currently there are still a lot of government employees who have never experience working with computers and its equipment. For those employees, providing a PC cannot simply changes work habits or practices. Launching a long-term change management might help them to enjoy working with PCs in a smooth transition phases.

Current environments of LAN & MAN are implemented with a base of four council and some parts of Wards so that network connection is limited. In addition, environments of network usage are also unstable since network lines are not physically protected. Therefore, the extension of LAN and MAN area for aims at schools, fire stations and public health centres is required for managing the higher e-Government services in the future; furthermore existing implemented network should be also e-aligned.

6.2 Network Security Reinforcing

Since current N/W is highly relying on one firewall, protecting important administration information and data is considerably fragile. Adequate equipments such as IPS, Firewall are crucially requited as well as N/W security and monitoring are vital to protect data from external invasion - Hacking, DDoS, Virus, etc. Moreover, it needs to introduce NMS (Network Management System) for effective management of N/W resources considering extended network implementation.

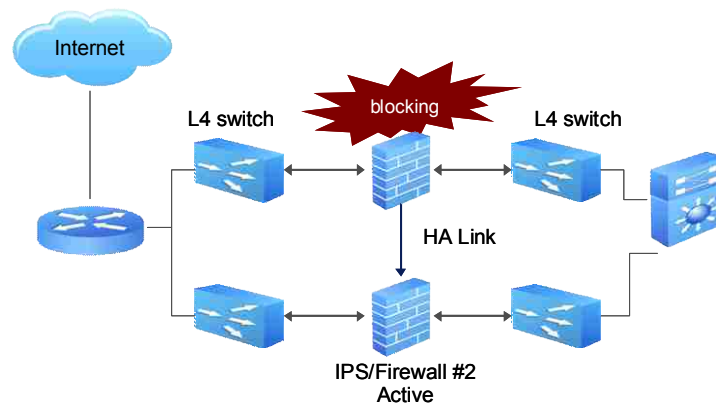


Figure 38: Firewall/IPS Configuration

7. Strengthen of IT organization capacity

MC should consider expanding IT unit. Refers to the current ICT status assessment, there are only 2 IT professionals. To implement more e-Government systems, IT unit should be expanded to a section and there should be two units: IT planning unit and System Management unit.

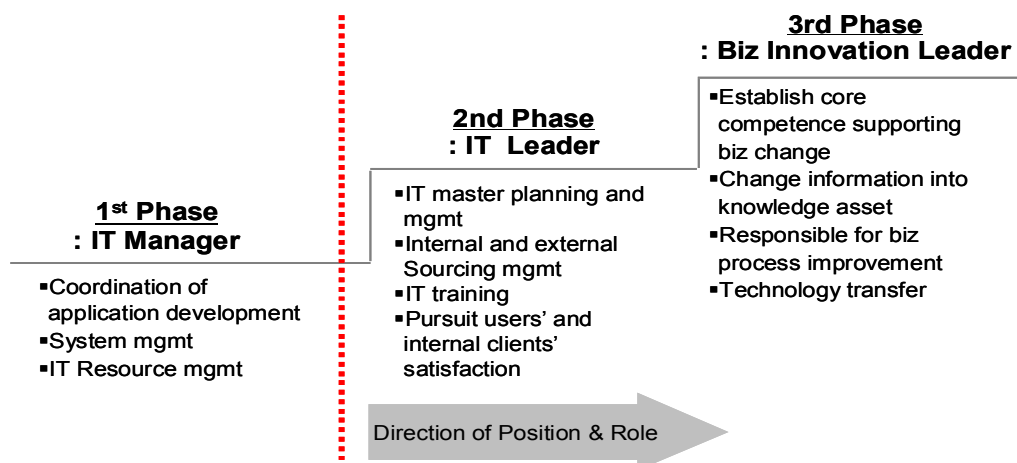


Figure 39: CIO role's Growth Phases

To increase in its capability, within DMC nurturing IT experts could be important, but due to the time factor, often it is recommended hiring more IT professionals from external sources.

Next, IT staffs' capacity building is required. Most of administrators and staffs operating IT system require SW, HW, and NW knowledge and management technology. In a long-term view, informatization and broad knowledge related to e-Government is required to IT planning staffs in order to design e-Government future image. SMG can provide educational programmes such as invitation training programmes which have been progressed by KOICA, and support the informatization of Dar es Salaam and building up the e-Government planning capacity.

E-Government training programmes which are progressing in SMG and KOICA are as follows:

Organizations	Types of educational programmes
SMG	• Seoul e-Government
KOICA	• E-Government specialist training • ICT policy specialist training • e-Learning, IT tutors training • e-business training

Table 29: Informatization training programmes of Korean government

Part 6. Implementation Strategy

- 1 Implementation Schedule***
- 2 Implementation Strategies***
- 3 Identifying Role and Responsibility (R&R) among organizations***
- 4 Cost estimation***

Part6. Implementation Strategies

1. Implementation schedule

Schedule for TO-BE promotion tasks is as follows:

Layers \ Year	Year 1	Year 2
Financial Resources	• Usage of Korea Trust Fund Ready for KTF Request Ready for KOICA Grant aid Request	• Usage of KOICA Grant aid
Office Automation	Groupware & EP	BPR & ISP File Management System Document Digitalization
Enhancement of IT Infra		PCs & LAN Enhancement of Network Security
Enhancement Capacity of IT Organization	Reinforcement of Organization E-Government Expert Training by Korea Groupware Training	E-Government Expert Training by Korea PC & Internet Training

 DMC's Role  SMC's Role

Figure 40: Implementation Plan

Considering practical possibility, cooperation process among public organizations, fund arranging process and preparation for informatization promotion, the period for promoting tasks takes approximately for 2 years from starting the project until terminating it. For the successful e-Government in Dar es Salaam project promotion, we suggest three implementation strategies like below.

2. Implementation Strategies

2.1 Korea Trust Fund from AfDB and Grant aid from KOICA

Since fund raising in Dar es Salaam is hard to be supported within the city, the fund-raising is considered as Korean government's grant aid or loan, and funds from international organization. Among them, it could be indicated the Korea Trust Fund (KTF) from AfDB and Grant aid from KOICA considering the practical feasibility.

Firstly, the plan for 2011 fund execution in KOICA is already fixed up so that the project could figure out that it needs to prepare them with the utilization in 2011 (In general, it takes normally 6~12 months from beginning to request the project

cooperation until reviewing the project's feasibility and approval.) Therefore, this project entrust the fund which was in KEXIM (The Export and Import Bank of Korea) to AfDB, and it is adequate to promote the project by utilizing KTF.

2.2 Informatization mind changes through Pilot-system implementation

The first factor to consider this F/S implementation is to recognize the necessity of informatization and to enhance the practical IT capacity of public servants in Dar es Salaam, First of all promotion organization should be familiar with informatization usage and build up a bond of sympathy about the necessity and importance of informatization for promoting e-Government initiatives. Therefore, in the first year, the F/S firstly suggests the Groupware system as the small size of pilot-project considering the scale of KTF (Korea Trust Fund). With this, the objectives of this F/S promote to enhance users' informatization usage and to change public servants' mind pertinent to informatization by experiencing in person.

2.3 Promoting Dar es Salaam as the core city of e-Government within East-Africa, and Leading informatization surrounding areas

Considering the environments factors such as recently explosive population, gradually increasing economic-population and geographical factors (i.e. the status positioning within the East-Africa area), and governments' strong will (esp. President) to promote e-Government, the F/S suggest Dar es Salaam to build up as the leader of e-Government, afterwards to spread its achievement and experience to surrounding countries of the East-African areas in a long-term view.

With this, the consulting team suggests to manage a cooperative bond based on Dar es Salaam and international organizations such as WeGO, EAC and UN for reinforcing the project promotion & execution.

For this, SMG fully supports strategic and technical resources with humanitarian direction for enhancement of citizens' living environments through the e-Government; on the other hand, Dar es Salaam tries to effort strong leadership for creating a outstanding e-Government case and affecting to neighbor area' informatization.

EAC and UN are charge in strategic supporting to spread ripple effects (e-Government cases to promote) from the project.

2.4 Cooperation Managing between two government and other organizations

This F/S is as the cooperated project with two governments, there are lots of stakeholders such as SMG, Dar es Salaam, and other funding organizations, so that cooperation relationship is the most essential. Therefore, the cooperation process managing for the project promotion needs in the first year.

First of all, Dar es Salaam should make a bond of sympathy with the Ministry of Finance in advance related to this project's validity and feasibility to be smoothly progressing the project.

Furthermore, SMG supports financial resources to Dar es Salaam to progress financial or technical resources by utilizing the cooperation relationship between SMG and KOICA.

3. Identifying Role and Responsibility (R&R) among organizations

Roles and responsibility among organizations to promote implicated strategies is as follows:

Task	DCC' role	IT Enterprise	SMG' role
Project identification	▪ Project identification and cooperation ▪ F/S support	▪ F/S performance	▪ Project identification and cooperation ▪ F/S support
Fund raising	▪ Fund application	▪ Guiding to make the application form	▪ Supporting the fund application
Groupware & Portal site implementation	▪ Project management	▪ Groupware & Portal site ▪ Education for using Groupware ▪ Maintenance education	-
EDMS implantation	▪ Project management	▪ EDMS implementation ▪ Education for using EDMS ▪ Maintenance education	-
Extension of LAN & MAN and PC distribution	▪ Project management	▪ LAN & MAN implementation	-

Task	DCC' role	IT Enterprise	SMG' role
Tightening up Network Security	▪ Securing network specialist	▪ Security system implementation ▪ Education for security reinforcing	▪ Guiding the establishment of DCC's security policy
Reinforcing IT organization's function & IT staffs' skill	▪ IT organization prestige soaring ▪ Securing additional IT staffs ▪ DMC staffs' PC training education	-	▪ Invitation education of e-Government specialist

Table 30: Role and responsibility of strategic tasks

4. Cost estimation

The F/S consultant estimated the total project costs for the above four project components. To estimate projects' costs, consultants carefully monitored and examined the market prices. This is estimation. The detailed final project costs will be determined and calculated once again by KOICA or donor agency.

Projects	Contents	Description	Cost Est.(US\$)
BPR/ISP	Consulting	One Consultant (20,000 USD per a month) X 10 Man-Month (project period is 4 month)	186,000
	Sub-total		186,000
Groupware & EP	H/W	EP Server, Groupware Server, Mail Server	162,000
	S/W	Groupware, Webmail, Portal Engine	164,000
	Sub-total		298,000
FMS	H/W	Web Server, Backup Server, SSO Server, WAS Server, DB Server, Search Server, Storage etc.	344,000
	S/W	WAS, DBMS, EDMS, Search Engine, Reporting Tool, BACKUP S/W, CMS Etc.	538,000
	Sub-total		882,000
IT Infra. Modernizing	H/W	LAN node, EMS Server, UPS etc	573,000
	S/W	Virus, EMS	128,000
	IT equipment	PCs, Scanners, Printers	118,000
	Sub-total		819,000
Total			2.213,000

Table 31: Cost estimation

The total estimated cost for the four project components is approximately \$2.2 million USD. This includes some services of customization, maintenance, yet IT training costs.

More detailed information will be provided to DCC. And POSCO ICT & DCC will continuously communicate to finalize the quantity and detailed specifications for the betterment for the project.

Part 7. Financial Plan

- 1 Implementation Schedule***
- 2 Implementation Strategies***

Part7. Financial Plan

1. Financial Plan

1.1 Funding Sources

The financial plan for this F/S composes with two funding sources; which are i) to utilize Korean Trust Fund (KTF) to implement the pilot project firstly, and ii) to utilize the grant aid from Korea International Cooperation Agency (KOICA) at the following stage.

1.1.1 Korea Trust Fund (KTF)

AfDB has managed the 25 Trust funds (2006.7). The funding terms are various ways from 100% “tied” to 100% “untied”. Recently, the proportion of “untied” is getting increase. The funding terms of KTF is 90% “tied”. Korea Gov. has donated the amount of 2 Million US dollars trust fund from 1998. And 540,000 of the fund have been spent.

The KTF (KOAPEC Trust Fund) is a fund established by the Korean government in 2007. Functions related to the operation and management of the fund are entrusted to the AfDB to be used in supporting KOAPEC activities.

KOAPEC stands for Korea Africa Economic Cooperation Conference but it does not limit itself to being a mere conference. Rather, it is a comprehensive mechanism for the pursuit of a lasting and mutually beneficial partnership between Africa and Korea. As an integrated system equipped with various financial facilities, KOAPEC aims to further the economic development of Africa and Korea through identifying, developing, and financing projects which maximize the two regions’ cooperative synergies.

In “KOAPEC action plan 2011/12” announced in last September, KOAPEC made known that they will enlarge their trust fund to 11 millions US dollars in 5 years. Then they intend to prepare 24 cooperation projects to implement.

In Mozambique, Algeria and Senegal, Consulting, development and construction projects of IT area has been prepared through the Korea Trust Fund. e-Government and narrowing the Digital Divide as well as ICT infrastructure development projects will be developed in a continuous and steady manner.

1.1.2 Korea International Cooperation Agency (KOICA)

KOICA, since its establishment in 1991, has been conducting grant aid and technical cooperation programs under the auspices of the Ministry of Foreign Affairs and Trade

(MoFAT).

KOICA implements two types of grants: grant aid which includes the provision of equipment, project aid and technical cooperation which includes development studies, the invitation of trainees, and the dispatch of Korean overseas volunteers and experts.

On the other hand, Official Development Assistance (ODA) is grants or concessional loans which are provided to developing countries, with the promotion of economic development and welfare as the main objectives. ODA is classified into three areas: i) bilateral grants - grant aid & technical cooperation, ii) bilateral loans, and iii) financial subscriptions and contributions to international organizations (multilateral).

- Korea ODA (Official Development Assistance) System

The government of Korea provides bilateral and multilateral aid. Korea International Cooperation Agency (KOICA) is an umbrella agency of the ministry of foreign affairs and trade. It provides grant aid and technical cooperation.

KOICA's grant aid and technical cooperation is a good source for IT project funding. Perhaps, it might be difficult to persuade internal decision makers to receive the order of priority, and to receive an approval from the higher government body including the ministry of local development and ministry of finance. However, it is highly recommend making an effort to take this opportunity.

According to KOICA, the typical procedure for project aid (grant) is as follows: (direct quote)

1. Survey request and receipt of project proposal through the Korean embassy
2. Selection of candidates project for pre-feasibility study
3. Pre-feasibility study
4. Preliminary planning and confirmation
5. Notification to the recipient country
6. Establishment of a project master plan
7. Dispatch of an implementation survey team and sign a Record of Discussion (R/D)
8. Confirmation of R/D by both governments through an exchange of Note Verbal or the signing of an agreement
9. Project implementation
10. Evaluation and follow up

As stated, a survey request is required, and to initiate this process, it is necessary to fill out the KOICA's "Project Request Form (PRF)." Dar es Salaam should start to make the request proposal. This F/S report contains most information that required from the request form. In addition, step-by-step guidance will be provided from the F/S

consultants.

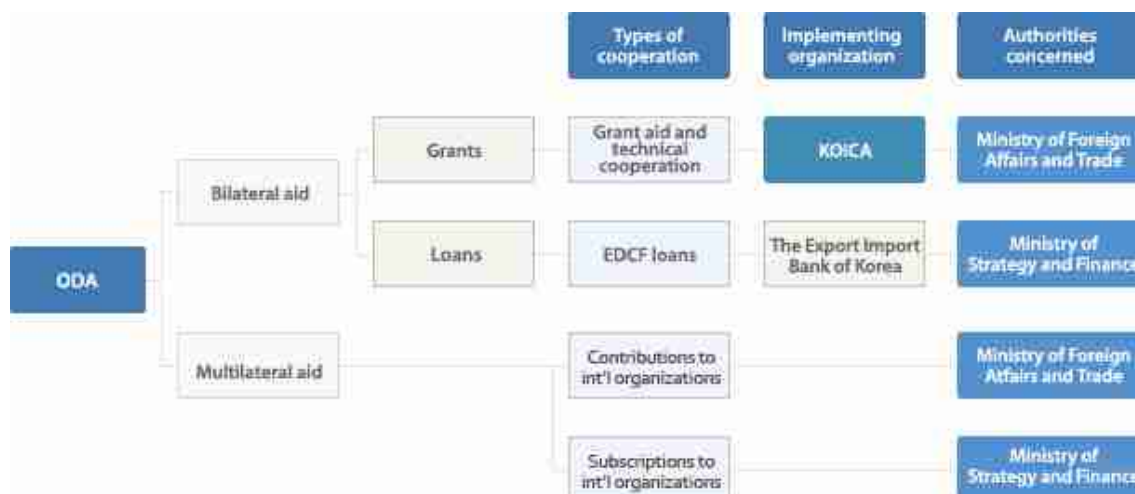


Figure 41: Korea's ODA System (source: KOICA)

Korea's ODA is still quite modest compared with that of other advanced countries. However, responding to the world's expectations for Korea to increase its role in international development efforts, KOICA continues its missions to share the experience unique to Korea as well as to inspire partner countries, thereby putting its principle of 'Cooperation for a Better World' into practice as it has supported to Tanzania.

- KOICA Tanzania

Established in 2002, the KOICA Office in Tanzania has been playing a leading role in implementing Korea's official development assistance (ODA) for Tanzania. KOICA has been engaged in several activities aimed at the socio-economic development of Tanzania with a priority on the health, education, agriculture and rural development sectors.

Further, KOICA has been focusing on sharing Korea's unique and successful development experiences by implementing a special program, the Training Program. The program places the greatest importance on human resource development, which is a key factor for sustainable development. In fact, more than 300 Tanzanians have participated in KOICA Training Programs, including the Scholarship Program.

Besides the Training Program, through the World Friends Korea program (previously known as the Korea Overseas Volunteers program), KOICA has been dispatching volunteers in various fields such as medical doctors, nurses, medical technicians, science and ICT teachers, veterinarians and agriculture specialists. Currently, about 90 volunteers are serving in Tanzania.

As actual cases, KOICA has also supported several projects including the Project for

Effective ICT Education at the CoET, UDSM, the Project for Development of Ground Water in Dodoma and Shinyanga, and the Project for Modernization of Farms and Rehabilitation of Irrigation in Morogoro and Zanzibar. Currently, KOICA is supporting the Project for Capacity Building for Diagnostic Services improvement of Health Centers in Dar es Salaam, and the Project for Capacity Building for Agro-processing in Dar es Salaam, Morogoro and Zanzibar.

- Activities at the KOICA Tanzania

There are 4 types of grant aid that KOICA office in Tanzania carries out, as follows: Development Projects, World Friends Korea Program, Training Program, and Cooperation with NGOs.



Figure 42: Activities at the KOICA Tanzania (source: KOICA Tanzania)

Six development KOICA projects have been implemented and currently three projects are ongoing in DSM, Morogoro and Zanzibar in the field of agriculture and health. As for volunteers dispatched by KOICA, currently 87 are working for Tanzania. As a special development program, KOICA invites Tanzanian officials to Korea for sharing development experiences. The number of invitees currently reaches around

400.

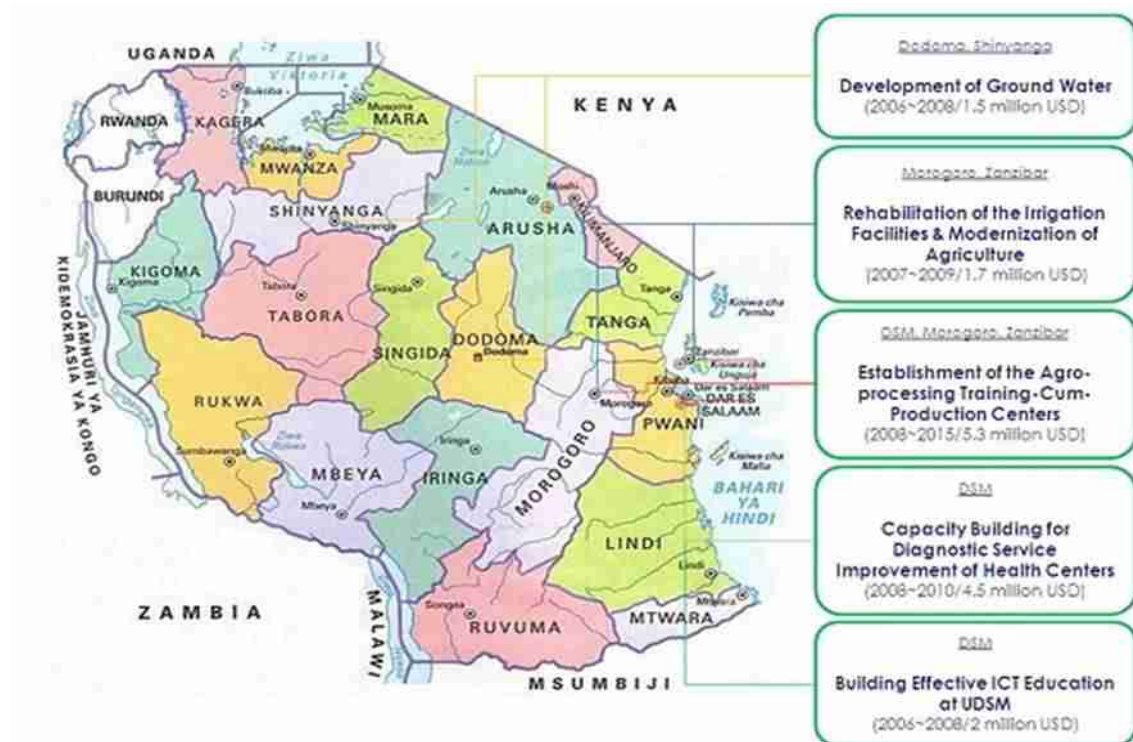


Figure 43: Implemented Projects in Tanzania (source: KOICA Tanzania)

1.2 Process of Funding Application

1.2.1 Korea Trust Fund (KTF)

- Relation of KTF Funding Process

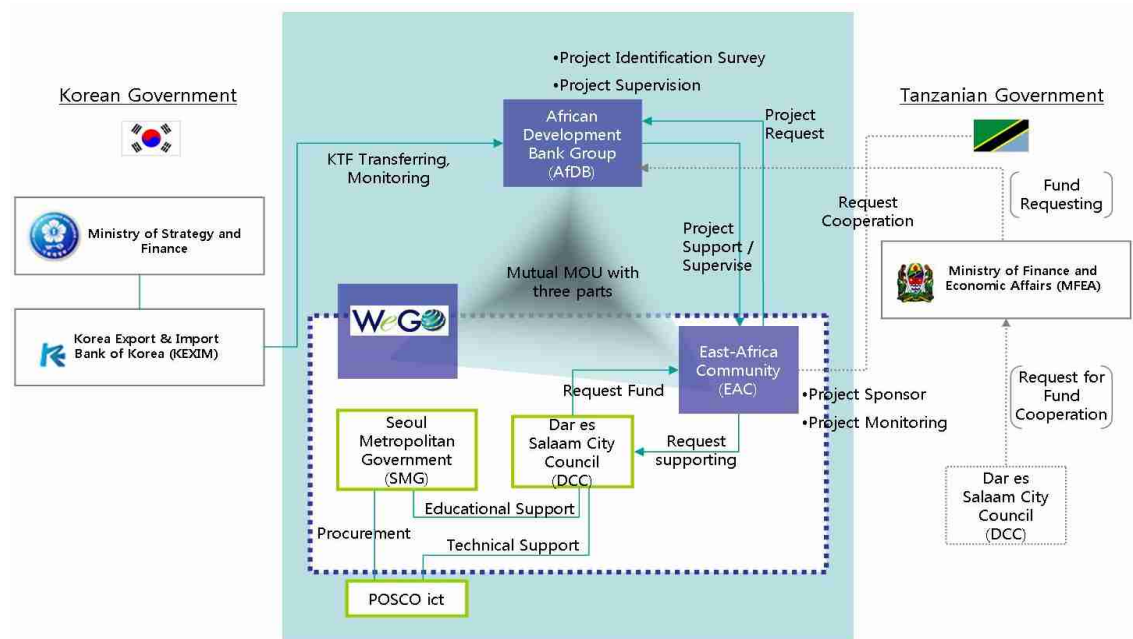


Figure 44: Relation of KTF Flow Process

At the first plan, this F/S proposes to get the financial resource by utilizing Korea Trust Fund (KTF), and this fund will be used to implement the pilot project. As the key strategy for the fund-raising, the first financial plan proposes the contract of mutual MOU with three parts; AfDB, WeGO and EAC. As a long-term view, this may have a great ripple effect to other potential opportunities in East-African countries.

1.2.2 Korea International Cooperation Agency (KOICA)

- Relation of KOICA Grant aid Funding Process

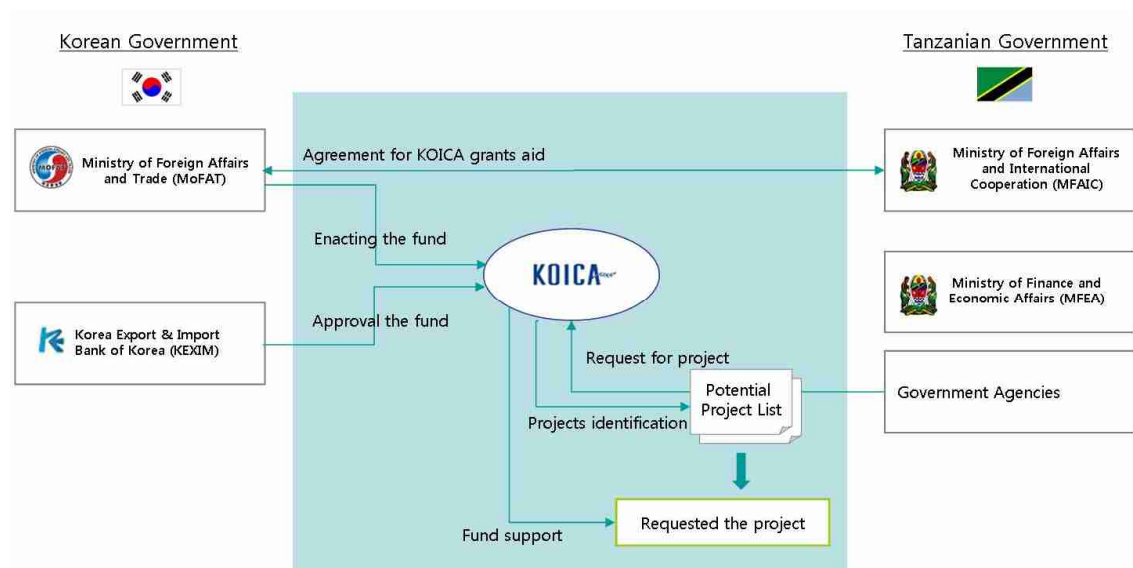


Figure 45: Relation of KOICA Flow Process

At the following stage, this F/S proposes to obtain KOICA grants aid as the financial resources. Securing the KOICA funding resources, SMG and IT enterprise supports the technical area in fund application of DCC for securing the priority among the preparing projects of Tanzania KOICA office. In the same time, SMG should ask to request the official cooperation to MOFAT and the HQ of KOICA.

- Process of KOICA Project Implementation

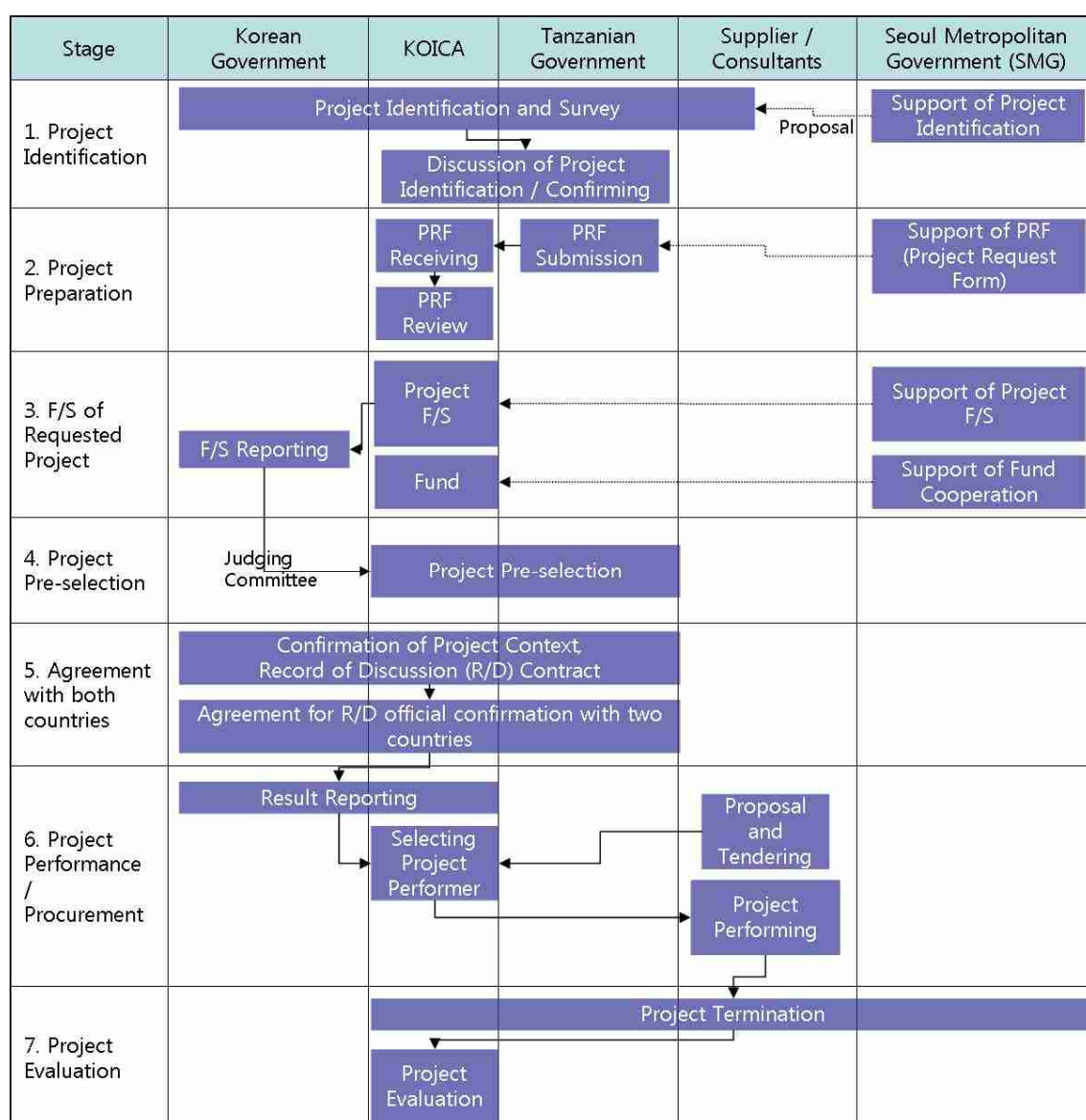


Figure 46: Process of KOICA Project Performance (source: KOICA)

1.3 Role of Stakeholders

- Stakeholders' role for financial process

For this F/S, stakeholders between two countries are categorized with two steps which are the plans for using Korea Trust Fund (KTF) within the first year, and the next plan for using KOICA Grant aid is the second step in the following year; defining major stakeholders' role which is related to fund application process each planning year is as follow:

Phase	Stakeholders		Role
KTF (1 st Year)	Korean Government	Ministry of Strategy and Finance (MoSF)	– Managing the fund for oversea development project – Approval the fund
		SMG	– Cooperation and supporting the project performance with DCC
	Tanzanian Government	Ministry of Finance (MoF)	– Cooperation and coordinating the fund between AfDB and EAC – Can directly request the fund to AfDB
		DCC	– Requesting the project to EAC – (Or) Requesting the project to Ministry of Finance (Tanzania Gov.)
	Other Organizations	AfDB	– As the top level of the project identification – Project supervision, supporting and monitoring KTF
		WeGO	– On behalf of SMG and DCC, contracting (MOU) with AfDB and EAC – Direct cooperation and supporting with AfDB and EAC
		EAC	– Project sponsor on behalf of DCC – Request the project to AfDB – Request the fund cooperation to Tanzanian Government
		KEXIM	– Under the organization of MoSF, KTF Transferring to AfDB – KTF Monitoring
KOICA Grants aid (2 nd Year)	Korean Government	Ministry of Foreign Affairs and Trade (MoFAT) Ministry of Finance	– Receiving the request of project – Making the R/D contract

Phase	Stakeholders		Role
		SMG	– Supporting the fund application and cooperation – Cooperation and supporting the project implementation with DCC
	Tanzanian Government	Ministry of Foreign Affairs and International Cooperation (MoFAIC)	– Making the R/D contract with MoFAT
		Ministry of Finance (MoF)	– Approval the fund
		DCC	– Be in charge of the project request – Fund application
	Other Organizations	KOICA	– Review requested projects list – Choosing the project to have actual effects – Supporting the fund
		Government Agencies	– Potential projects survey and request

Table 32: Role of stakeholders

Part 8. Consideration

- 1 Training Plan***
- 2 Project Management***
- 3 Implementation Organization***
- 4 Operation and Maintenance Plan***

Part8. Consideration

1. Training Plan: Training Subject and Content

The successful informatization of the DCC demands consensus on its necessity shared by not only IT section but also the DCC staff as a whole. DCC should nurture IT experts to contribute to the IT system development. The e-Government system users should be encouraged to learn basic IT skills and how to use a PC and the systems.

DCC should draw up a training policy, making efforts to develop training programs in a constant basis, and need to consider building an IT training center in a long-term.

1.1 Training for Field Staff

- Objectives: Learn the roles of field divisions during system implementation and how to use the e-Government systems.
- Training Content
 - Basic computer and IT application skills
 - e-Government system processes and implementation direction
 - Roles of field staff and participation during system implementation
 - Components of the e-Government system and their usage

1.2 Training for Field Staff

- Objectives: Manage the computerized system and set up rational policies.
 - Basic computer and IT application skills
 - IT project management plan
 - System components and operating plan
 - Latest IT trend and best practices of advanced countries

1.3 Training for IT Professionals

- Objectives:
 - Foster the capability to develop, operate and maintain the system
 - Nurture experts, who will lead IT in the DCC and can teach general DCC staff IT knowledge

- Training Content:
 - Application S/W Area
 - S/W engineering and System analysis and designing technique
 - Programming language (development language)
 - Server and Local Network Area (LAN)
 - Fundamentals of System & Network
 - System & Network Administration
 - Troubleshooting & Performance Tuning
 - System S/W Area
 - Database Architecture & Administration
 - Programming with DBMS
 - Acquisition of Latest IT trend and technology
 - Benchmark overseas best practices

2. Project Management

The Integrated Management Methodology which is applied to the Local e-Government Project is constructed to integrate and manage the development methodology and project management of each area. It provides a consistent process from system analysis design to the application test stage.



Figure 47: Project management area

Project Management must consist of a well-defined systematic process in order to plan, observe, monitor, and control inter-related tasks. The determined goal can be achieved with the provided budget, time, resources, and technical limitation through this process. This project consists of four stages: initiation, planning, execution & control, and completion.

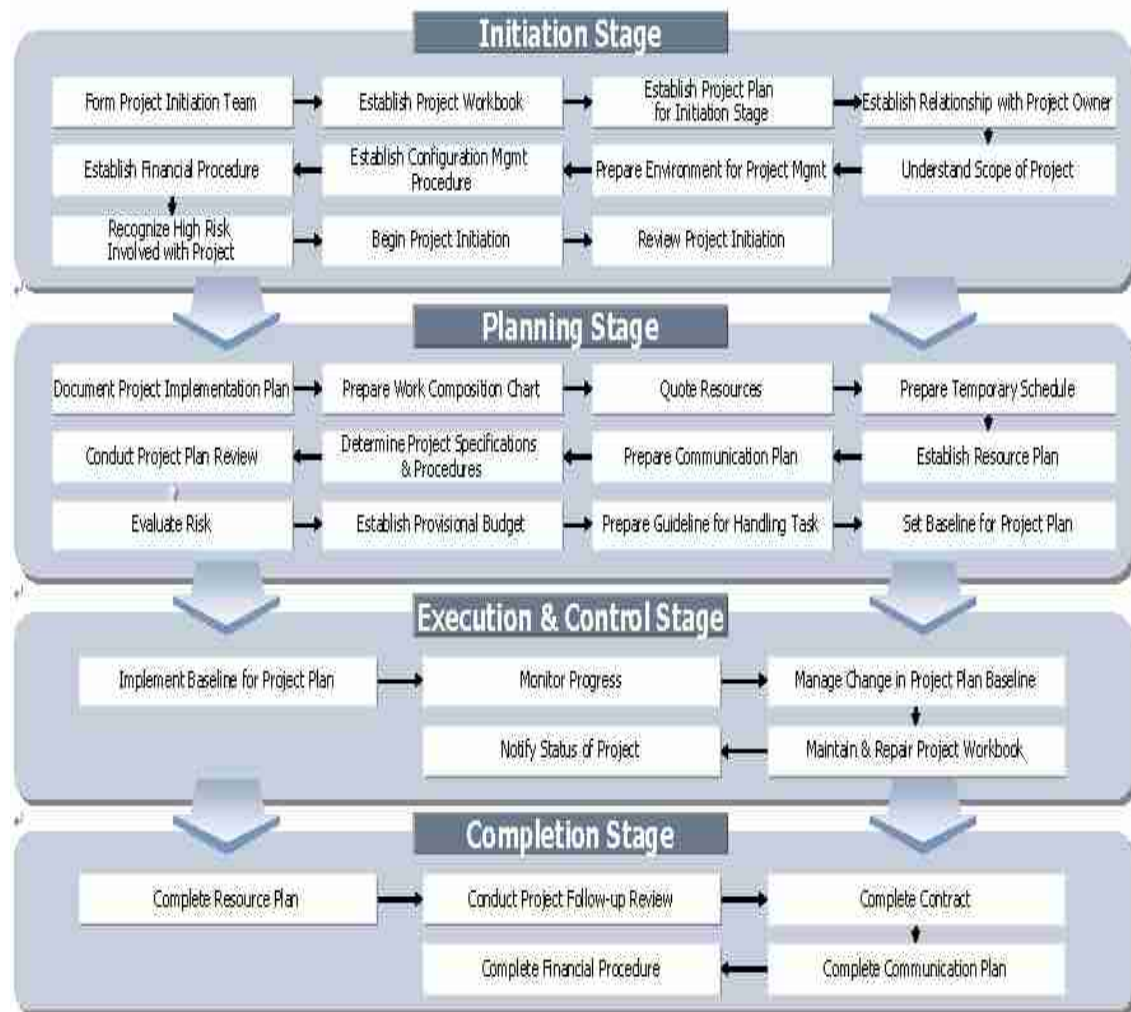


Figure 48: Project management methodology

3. Implementation Organization

Establishing a separate driving force and allotting a part to each organization shall be unconditionally required since the informatization is vast and long-term thereby resulting in changes on the current work processes. The outsourcing to the outside development professional is inevitable since the DCC itself cannot develop the whole system. The system integrator shall do its best in establishing an information system in line with the status of DCC based on the professional knowledge.

3.1 Role and Responsibility (R&R)

- **Project Steering Committee:** a standing investigation committee, that investigates disputes between departments and main issues and makes a decision over what to propel and where to head, and manages the system integrator.

- **Advisory Committee:** committed to counsel by to-be driven fields such as the improvement of law and regulations, establishment of information infrastructure, implementation of software and standardization, and strategies.
- **Law/System Revision:** composed of the personnel on grant/loan to each working department and committed to the practical affairs such as revising laws, improving systems and establishing a detailed plan for system improvement.
- **System Establishment and Operation:** assigned to the practical affairs related with system establishment such as operating the existing system, setting up the movement plan of a new system and future operation along with the system integrators
- **Field Work Coordinator:** composed of the coordinators from each department and committed to collecting needs from their department especially from the field officers.
- **Education and Publicity:** conduct educational training for both inside/outside users and outside user-oriented publicity activities, and collect opinions from the stakeholders.
- **Systems Integrator:** be wholly charged of the implementation of e-Government systems, responsible for completion of the project.

3.2 Internal Participation

- Select DCC officers from each department and have them work and participate in the Task Force Team (TFT)
 - Advise on the real work processes or systems and closely cooperate with the personnel of the TFT in order to achieve successful system development.
 - Take charge of being a liaison between the departments where they belong to and the TFT and strive for appreciation between organizations.
 - The substantial revising works for procedures or systems shall be conducted by the departments where they belong to.

3.3 Set-up a TFT for e-Government Project

The TFT of the DCC shall consist of in combination of IT personnel and the personnel of the offices thereby preventing the generation of idle manpower due to one-sided increase in the computing personnel.

The officers, once sent to and worked in the TFT can play a leading role in testing, simulating operation, and training for the new system.

3.4 Commitment of Employees

DCC employees may take part in the whole development process, from system analysis to design and implementation.

In addition, that positive participation will bring a good result in information sharing about informatization or IT projects in general, IT capacity-building and technology can be transferred toward the DCC.

4. Operation and Maintenance Plan

4.1 Operation Plan

There required a method that enables efficient operation for the resources such as server, system software and network equipments consisting of the whole system in order to guarantee reliable and stable operation of the newly established computerized system.

4.1.1 Training Strategy

- **Training of Operational Personnel**
 - At the level of system implementation, both the outsourcing developer and would-be operator should be encouraged to work together thereby enabling the operator to independently administer the system after the development is completely finished as well as contributing to cultivating the ability for stable and reliable system operation.
- **Select trainee**
 - Select targets under full consideration of personal IT ability and role
- **Participate in system development project**
 - Take part in the development of server and network infrastructure
 - Take part in database design
- **Instruct the personnel**
 - Instruct the operators by fields : Use the instruction facilities of the outsourcing developer and vendor
- **Technology transfer**
 - Set up technology transfer plan by fields
 - Improve operating ability via technology transfer

4.1.2 System Control and Management

In order to assure that the new system is operating without a hitch, continuous control & management will be required thereby promptly coping with abrupt errors as well as preventing excessive network traffic.

- **Server Control & Management**

- Monitor the performance and error status of all servers by establishing management server at data center
- Collect CPU performance, memory usage and various event messages
- Detect an error on real-time basis and take measures against the error

4.2 Maintenance plan

- The maintenance activity is for keeping the normal state of the whole system and accepting user's request arising from the changes on environment.
 - Set up maintenance system for efficiently managing a variety of application software, computing equipments, networks and system software.
 - At the initial operation level, the developer should support the operation and maintenance for a certain period of time thus elevating safety and system efficiency.
 - To secure prompt maintenance and repair system, an advanced foreign developer and IT Company shall be jointly committed to the project.
 - In order to ease the future maintenance activities, development standards should be established and the quality should be strictly managed during the application development.

4.3 Disaster Recovery Plan (DRP)

In preparation for Act-of-God, a backup and recovery plan shall be set up and the pilot test shall be continuously conducted for verifying the appropriateness of the plan thus securing fast recovery.

- **Backup recovery plan**

- Prepare for the materials and computing resources required for backup and recovery
- Appoint a master manger for backup and recovery and have him/her fully equipped for the job
- Set up priorities and then effective backup & recovery procedure

- **Pilot test**

- Prepare for the pilot test in preparation for possible disaster
- Verify the appropriateness of the plan and, if required, correct the plan

4.4 Risk Factors

4.4.1 Resistance factors

- **Resist against the Informatization**
 - The employees may take a stand against the automated work processing since they tend to stick to the old customs.
 - No-paper work may result in maladjustment to the new system thus leading to confusion and degrading the system effectiveness.
- **Tangle with the assigned roles**
 - Organizational environment changes for efficient work processing.
 - New works are being created in return for the decrease of the existing manual works.

4.4.2 Undertakings

- Perform both existing and new work processes simultaneously for a certain period of time
 - Encourage the users on condition that the user interface will be enhanced when the pre-training and system is completed thus minimizing inconvenience of the users.
 - The system change including no-more document should be first applied to loyal entities in the way of no-attachment and gradually expand the applicable scope.
 - A Manual Work Processing Directive, tentatively called, should be set up and always ready for possible system errors.
- Change over the recognition on Know-how open and award incentive
 - Awaken people to a sense of cooperation: individual know-how makes an organizational know-how (information sharing benefits all)
 - Consider the possibility that the statistics works are utilized for making a decision for works in field by giving an incentive to know-how provider.
- Coordinate concerns between departments via the Coordination Committee
 - Assign roles according to the characteristics of the new system, but fairly and reasonably
 - Set up a coordinating committee and commit it to discuss and decide main policies

early in the computerization and have officers work in the informatization driving force thus scheming understanding between entities.

*Appendix1. **Abbreviation***

List of Abbreviation

AfDB	African Development Bank
B2B	Business to Business
B2C	Business to Customer
BBS	Bulletin Board System
BPR	Business Process Reengineering
Bps	Bit Per Second
CAS	Corporate Accounting System
CIO	Chief Information Officer
DBMS	DataBase Management System
DCC	Dar es Salaam city council
DSL	Digital Subscriber Line
EA	Enterprise Architecture
EAC	East african community
EDCF	Economic Development Cooperation Fund
EDMS	Electronic Document Management System
EMS	Enterprise Management System
EP	Enterprise Portal
EU	European Union
F/S	Feasibility Study
FMIS	Financial Management Information System
FMS	File Management System
FS	Feasibility study
G2B	Government to Business
G2C	Government to Customer
G2G	Government to Government
G4C	Government for Customer
GDP	Gross Domestic Product
GIDC	Government Integrated Data Center
GIS	Geographic Information System
HR	Human Resources
IBRD	International Bank for Reconstruction and Development
ICT	Information and communication Technology
IMF	International Monetary Fund
IMO	International Maritime Organization
IOC	International Olympic Committee
IOM	International Organization for Migration
IPS	Intrusion Prevention System
IPU	Inter-Parliamentary Union
ISO	International Organization for Standardization
ISP	Information Strategy Planning
ISP	Internet Service Provider
IT	Information Technology
ITA	Information Technology Architecture

ITSO	International Telecommunications Satellites Organization
ITU	International Telecommunication Union
ITUC	International Trade Union Confederation
KEXIM	Korea export and import bank
KOICA	Korea International Cooperation Agency
KTF	Korea trust fund
LAN	Local Area Network
LDAP	Lightweight Directory Access Protocol
LDC	Low Developed Country
MAN	Metropolitan Area Network
MIC	Ministry of Information and Communication
MoF	Ministry of Finance
MOGAHA	Ministry of Government Administration and Home Affairs
MOU	Memorandum Of Understanding
MP	Master Plan
NMS	Network Management System
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PAPR	Public Administration Process Re-engineering
PC	Personal Computer
PIS	Personnel Information System
PKI	Public Key Infrastructure
R&D	Research & Development
R&R	Roles and Responsibilities
SI	System Integrator
SMG	Seoul Metropolitan Government
SMS	Short Message Service Text
SSO	Single Sign On
TFT	Task Force Team
UN	United Nations
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UPS	Uninterruptible power supply
US	United State
VoIP	Voice over Internet Protocol
WAN	Wide Area Network
WB	World Bank
WCO	World Customs Organization
WeGo	Would e-Government organization